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MASSACHUSETTS WATER RESOURCES AUTHORITY

ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS OF WATER AND SEWER CHARGES

GOVERNMENT DOCUMENTS
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DECEMBER, 1986

MASSACHUSETTS WATER RESOURCES AUTHORITY

ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS OF WATER AND SEWER CHARGES

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EXECUTIVE SUMMARY

As required by its enabling legislation, the Massachusetts Water Resources Authority has conducted a study of the environmental, social and economic impacts of its charges for water and sewer service upon its member communities, and the Commonwealth at large. This report presents the results of that study and the data that was compiled and analyzed to assess these impacts.

Pursuant to its statutory requirements, the Board of Directors reviewed alternative water and sewer rate structures and methodologies in conjunction with this study. After reviewing the various policy issues associated with different wholesale rate methodologies, the Board voted to retain the current methods of charging communities for water and sewer service. This decision reflects the Board's concurrent commitment to encourage and assist member communities to develop retail rate structures which promote water conservation and to move to full metering of community sewer flows as the most accurate alternative to the current estimation method.

The impacts of Authority charges on member communities, using current wholesale charge methodologies, can only be quantified in approximate terms, given the absence of detailed local usage data and the variety of local financing methods. Given these limitations however, the following general impacts are noted.

Environmental

Additional wholesale costs are providing stronger financial incentives to impose and/or increase retail user rates, thereby promoting water conservation at the local level. To the extent that Authority charges are based upon community water and sewer usage, they also provide greater incentives for localities to reduce sewer infiltration and inflow, and otherwise develop more effective water management programs. In addition to such local benefits, significant regional benefits are anticipated as a result of Authority programs financed through its charges to member communities. These include increased recreational opportunities, reduced exposure to health risks and enhanced commercial fishing conditions in Boston Harbor and its environs.

Social

Increased local costs of water and sewer service must be financed either directly through user charges or through a community's property tax levy. To the extent that member communities "pass through" these costs with increased user charges, Authority charges will more directly burden individual users. The ability to pay such charges varies widely among households within the Authority's service area and between residential and non-residential users within each community. Local rate structures which pass on most or all of the Authority's charges to individual users will thus impose proportionately higher fiscal burdens on those households (or non-residential users) with the least ability to pay, as measured by income data. Thus, some relief programs or income-based subsidies at the retail level may be necessary to mitigate these impacts on low-income users.

Economic

Authority charges to member communities constitute an important new element in local budget planning and fiscal policies. Statutory tax levy limits have required most member communities to shift these costs to user charge financing, as a means of reserving local tax funds for other municipal services. In some communities it is possible that other local water and sewer system needs may be subordinated to Authority charges, as local rate increases require larger shares of local resources. The impact of such local rate increases on private economic or business decisions within member communities is not clear, although water-intensive manufacturing or processing firms will clearly face increased operating costs of some magnitude. As with the potential social impacts of increased user charges, local financing decisions and rate structures may be expected to take these factors into account.

The final phase of the impact study, presently under way, is the development of a management plan for the Authority. The management plan will identify program and data elements required for future analysis of community usage, as well as potential roles for the Authority in the development and implementation of conservation-based retail rates. The Authority expects to periodically reassess the impacts of its charges as the level of those charges continue to rise.

I. INTRODUCTION

Chapter 372 Section 8(e) of the Acts of 1984 requires the Massachusetts Water Resources Authority to prepare and publish "a comprehensive study of environmental, social and economic impacts of its charges to serve as a basis for the implementation of charges fully consistent with...(its) objectives". The Authority hopes that this report is used as a base for exploration and discussion of these issues by the Governor, Legislature, MWRA Advisory Board and its cities and towns, and the general public. The current and future impacts of the Authority's rate structures and charges concern individuals and institutions throughout the Commonwealth and the Authority has been vigilant in ensuring unparalleled public participation in its decision making process.

The Legislature and Governor have recognized the need to establish an agency capable of marshalling the resources necessary to deal with the deplorable condition of Boston Harbor and the awesome but fragile water supply network. One result of that step is the shift of the costs of water and sewer programs from partial state support to a full charge system to the cities and towns served by the Authority. Burdens have been shifted from taxpayer to rate payer and over the next fifteen years those burdens will increase substantially. This report identifies some of the impacts of the Authority's rates on communities and establishes a number of policy issues for discussion. It further presents the Authority's decision to continue its current rate structure.

This report serves as an update. It shows clearly the Authority's current position on rate issues and which issues lie ahead. Even as this report was being developed conditions and issues changed. The Authority's vote to take responsibility for the combined sewer overflow program and its decision to implement short and long-range water supply policies have already changed the rate picture. In the future, the Authority will work with interested groups concerned with rate implications of the critical issues of harbor clean up, maintenance, and water supply functions.

As part of the study which produced this report, the Authority will be developing a comprehensive plan to work with the 60 MWRA member communities to review and improve local rate structures. It is clear that local rate structures must be reformed in partnership with the Authority's structure of charges to guarantee the accomplishment of the goals set forth in Chapter 372. The development of that partnership is a central task the Authority is committed to accomplishing.

All of these activities are to be carried out in concert with aggressive leak detection, infiltration and inflow, conservation and public education programs. The Authority will safeguard resources while ensuring equitable distribution of costs so that public confidence in the safety, reliability and efficiency of water and wastewater services is restored.

II. PROJECT SUMMARY

The main objective of this study is to assess the impacts of alternative wholesale water and sewer rate methodologies in order to facilitate the Authority's implementation of its selected methodologies for FY 1988. These methodologies must be consistent with the intent of the Authority's enabling legislation. This chapter highlights the Authority's approach, the project team organization and the role of the MWRA Advisory Board in this study.

APPROACH

In order to attain the study's objective, the Authority utilized a project approach consisting of the following five major components:

1. Community Data Compilation
2. Alternative wholesale rate methodologies
3. Selected wholesale rate methodologies
4. Estimated impact of selected methodologies
5. MWRA Management Plan.

Each major task is described briefly below and detailed in subsequent chapters of this report.

Community Data Compilation

The objective of the community data compilation task was to construct a community data base to facilitate on-going Authority impact analyses of the current and alternative wholesale rate methodologies on each community. This task represented the first attempt by the Authority to compile data on the communities it serves. The data compilation process, composed of data collection, data base construction, and confirmation, established a comprehensive community data base. This information was subsequently used to estimate the economic, social and environmental impacts of alternative rate methodologies.

Data compilation is further described in Chapter III of this report.

Alternative Wholesale Rate Methodologies

The objective of this task was to develop alternative wholesale water and sewer rate methodologies for consideration by the Board. This process included preparation of descriptions and the advantages and disadvantages of the current and each alternative wholesale rate methodology. In addition, the share of FY 1987 costs which would have been borne by each community under each of the methodologies was estimated to assess the impact of the alternatives. This comparative information was presented to the Board to facilitate their evaluation and selection process.

The current and alternative wholesale water and sewer rate methodologies are described in more detail in Chapter IV of this report.

Policy Issues and Selection Rationale

The objective of this task was the selection of one water and one sewer rate methodology by the Board. To accomplish this objective, the Board considered descriptions and impacts of the alternative rate methodologies, as previously described. In addition, a number of relevant policy issues were identified and submitted for Board consideration.

The MWRA Advisory Board provided important input in the discussion of policy issues. This input dealt with the issue of wholesale versus retail water rates as a means of encouraging water conservation at the user level. The Advisory Board noted that water rate methodology revisions at the retail level will be more likely to provide a direct financial incentive to reduce water usage than wholesale rate methodology changes.

Upon consideration and evaluation of the alternative wholesale methodologies and policy issues, the Board elected to retain the current water and sewer wholesale rate methodologies.

A further discussion of the policy issues and Board selection rationale is presented in Chapter V of this report.

Estimated Impact of Selected Methodologies

Consistent with the MWRA's enabling legislation, the objective of this task was to estimate the economic, social and environmental impacts of the selected water and sewer methodologies and charges. This analysis was performed for the MWRA member communities.

The Authority wishes to note that certain types of impacts of a given methodology are difficult to quantify, given the subjectiveness of the criteria and data variability. Accordingly, certain impact analyses are presented and discussed in general terms where necessary.

A further discussion of the impact analyses performed is presented in Chapter VI of this report.

MWRA Management Plan

The final task of this study is the preparation of a management plan. This management plan, scheduled for completion in January, 1987, will provide a detailed description of how the Authority's annual water and sewer charges are to be computed, and the required data elements to do so. Also, additional procedures will be outlined to facilitate future data collection and data base maintenance, as well as methods by which the MWRA can assist its member communities in establishing conservation-based retail rate structures.

A brief discussion of the Plan's purpose and content is presented in Chapter VII of this report.

PROJECT TEAM ORGANIZATION

Authority personnel directed the Rate Methodology and Impact study. The Authority received technical consulting and engineering assistance throughout the study from several consultants. The project team member firms and their respective responsibilities are described below.

Peat, Marwick, Mitchell & Co. (Peat Marwick) served as the prime contractor to the Authority. Peat Marwick's responsibilities included taking the lead in the study's major tasks, including compiling community data, estimating community assessment impacts and developing the management plan. In addition, Peat Marwick coordinated the efforts of the project's three subcontractors.

Black & Veatch, served as the project's engineering subcontractor and was instrumental in developing alternative wholesale rate methodologies and the respective community charges for each method.

DMC Engineering, Inc. and Susan Perna-Damon assisted in the compilation of community data as MBE and WBE project subcontractors, respectively.

MWRA ADVISORY BOARD PARTICIPATION

The MWRA Advisory Board functions as a direct liaison with MWRA communities. The Advisory Board staff provided valuable input regarding data compilation, wholesale rate methodologies and wholesale and retail rate policy issues during the course of the study. The Advisory Board's concerns about the relationship of wholesale and retail water rate methodologies were important considerations in the Board of Directors' deliberations and final wholesale rate methodology selections.

In addition, the Advisory Board's community data base and questionnaire provided valuable input to the study's community data compilation task. They also provided relevant comments when appropriate on this study's other major tasks and reports.

III. COMMUNITY DATA COMPILATION

This chapter describes the compilation of community financial and demographic data and the construction of a comprehensive MWRA community data base. The data base (see Attachment A) contains data elements beyond those directly related to this report and will be utilized by the Authority for a number of purposes. Generally, the purpose of this data base is to facilitate MWRA on-going analyses relating to alternative wholesale rate methodologies and Authority assessments. The data base served as the basis for various impact analyses in this report as later presented in Chapter VI and Attachment B.

The community data compilation task was composed of three major activities:

- Data collection
- Data base construction
- Data confirmation.

Each activity is described below.

DATA COLLECTION

Data collection was conducted primarily through the distribution to and completion of a questionnaire by the MWRA member communities (see Attachment C). Community officials were requested to respond to questionnaire inquiries relating to water and sewer rate structures, revenues and expenditures, systems, and the like.

Once the questionnaires were transmitted, site visits were conducted by the Authority's consultants to answer questions and assist in completing the questionnaires.

In addition to the questionnaires, community data was compiled from several other sources. The 1980 Federal Census Data was used to obtain community demographics. The Massachusetts Department of Revenue provided other community fiscal data.

DATA BASE CONSTRUCTION

The community financial and non-financial data described above was used to construct a comprehensive MWRA community data base. This data base was constructed using Lotus-2 software on an IBM-XT microcomputer. A coding structure was established to facilitate data sorts and combinations which were instrumental in subsequent impact analyses. The data base was also constructed to be compatible with and utilize the Advisory Board's data base.

The data base is composed of data for the 51 MWRA communities. While service is provided to 60 communities, the rate base is made up of 51 communities due to the purely contractual MWRA relationship with the remaining nine communities. It includes over 100 separate data fields consisting of demographic, fiscal, water and sewer system operations, retail rate structure, and other information. Data provided directly from the communities generally reflects FY 1985 operations, which was the most recently available data. Correspondingly, the majority of demographic data was collected from the 1980 federal census.

The data base will be maintained by the Authority at this study's conclusion and utilized for general informational purposes and future impact analyses.

DATA CONFIRMATION

Upon completion of the preliminary data base, each community was requested to review data and confirm, correct, or update its data base where necessary. Upon receipt of the community's revised data, the MWRA community data base was updated as appropriate.

IV. ALTERNATIVE WHOLESALE RATE METHODOLOGIES

This chapter presents the current and alternative sewer and water rate methodologies. Each methodology represents a different alternative for charging wholesale sewer and water costs to communities served by the Authority.

The MWRA currently provides sewage service to 43 cities and towns. 38 community sewer systems have separated sewers, while five communities have combined storm and sanitary sewers which discharge into the MWRA interceptor system. Wholesale water service is provided by the MWRA to 25 communities on a fully served basis, 10 communities on a partial basis (that is these communities have alternative sources of supply in addition to MWRA), and 10 other communities on a special contractual basis. The safe yield of existing water supply of 300 million gallons per day (mgd) has been fully utilized for at least the past ten years. In the absence of prolonged drought conditions during this period the existing supply has been generally adequate to meet the needs of the MWRA customer base.

The methodologies considered for sewer and water include:

Sewer

- Alternative S-1 - Population and Population Equivalent (current method)
- Alternative S-2 - Unit Cost (includes three options)
- Alternative S-3 - Unit Cost with CSO Option.

Water

- Alternative W-1 - Average Cost (current method)
- Alternative W-2 - Marginal Cost (includes two options)
- Alternative W-3 - Inverted Block.

These methodologies, with corresponding advantages and disadvantages, are further described in the following pages. The methodologies and related community charges have been developed utilizing FY 1987 MWRA wholesale system costs of service and FY 1985 community usage data, which constitutes the most recently available data.

ALTERNATIVE SEWER RATE METHODOLOGIES

Sewage discharges from member communities, regardless of the type of sewage system, are comprised of two components including: (1) Sanitary (point source) discharges from residential, commercial, industrial and other identifiable (measurable) sources; and (2) Non-point discharges which include storm water, infiltration, and inflow. Sanitary and non-point community sewage discharges are not currently measured at each community connection point to the MWRA interceptor system. Sewage system costs are incurred by MWRA to collect and treat both sanitary and non-point sewage discharges.

Determination of each member community's proportionate responsibility for MWRA sewage system costs of service is presented for three basic alternatives. The existing population and population equivalent methodology assigns cost responsibility to communities generally in proportion to its population relative to total system population. The proposed alternative unit cost methodologies assign cost responsibility to communities in proportion to sanitary and non-point source sewage flows estimated to be discharged to the MWRA interceptor.

This section presents a discussion of each alternative sewer wholesale methodology, including a description of the respective advantages and disadvantages. This discussion is followed by tables presenting resulting FY 1987 sewer charges by community for each alternative independently and in total.

ALTERNATIVE S-1 - POPULATION AND POPULATION EQUIVALENT (CURRENT METHODOLOGY)

Alternative S-1 provides for the assessment of costs of service to communities using the existing population and population equivalent (P&PE) methodology, which is the current or base case alternative. The sewage system costs presented for each community under Alternative S-1 are the actual fiscal year 1987 sewage charges adopted by the MWRA.

This current MWRA wholesale rate methodology was developed by MWRA's predecessor, the Metropolitan District Commission (MDC), during a period from late 1978 through early 1980. This methodology was designed to meet both federal user charge requirements and the population and population equivalent provisions of Chapter 814 of the Commonwealth of Massachusetts Acts of 1975.

The basic steps involved in determining member community sewage cost responsibility under the existing population and population equivalent (P&PE) methodology may be summarized as follows:

- Establish the total annual budgeted revenue requirements, or costs of service to be recovered.
- Allocate costs of service to functional cost components.
- Gather and compile water usage, customer sewer connection, sewage strength and other data from each member community and identified individual large commercial and industrial users.

- Distribute allocated costs of service to member communities in proportion to population and the population equivalents of industrial sewage discharges as determined from water usage, connection, strength and other data.

Identification of costs to be recovered from member communities is determined through established MWRA budget development procedures. Once completed, the budget identifies the estimated operation and maintenance expenditure level, and the project debt service and other costs anticipated for the forthcoming fiscal year. Budgeted costs are formally prepared and presented to the MWRA Board of Directors for approval. Upon Board approval, the budget document is the basis upon which forthcoming fiscal year sewage assessments are determined.

In order to meet EPA user charge requirements, budgeted costs are next allocated to functional cost components. Functional cost components have been established based on the results of detailed analysis of the Sewerage Division's cost accounting data, and the operation and design of major sewage system facilities and processes. Based on the results of these analyses, Sewerage Division operation and maintenance expense and capital related costs associated with each major sewage system facility are allocated to the functional cost components based on the principal design basis of the facility. Functional cost components currently used by the MWRA include volume of sewage, capacity or rate of flow and suspended solids strength. Operation and maintenance and capital related costs of service are allocated to functional cost components to facilitate subsequent distribution of these costs of service to member communities based on their estimated sewage discharges.

Currently, total sewage flow reaching the treatment plants represents the combined sewage service requirements, or units of service for all member communities. Total sewage flow reaching the treatment plants may be separated into two components. The first component is the point source sewage flow, which is the sanitary and process wastes discharged by residential, commercial, industrial and other establishments. The current method of establishing each community's sanitary point source sewage flow is based principally upon reported total metered water sales information provided annually by all municipalities through the Customer Use Data Summary Forms. Adjustments to metered water volumes are made to recognize the some portion of water sales to nonindustrial and industrial customers is not returned to the sewer system. Nonindustrial sanitary sewage volumes are currently estimated as 90 percent of the nonindustrial users metered water sales to provide an allowance for nonsewered water use such as lawn irrigation, car washing, etc., that does not reach the sewage system. The 90 percent factor is applied to all communities' nonindustrial water sales and does not recognize potential variation in water return factors among municipalities. Industrial water volumes are adjusted to determine sewage flow based on documentation submitted by each industry and investigation of industry by the MWRA Industrial Waste staff.

The second component of sewage flow reaching the plant is non-point source sewage flow, which consists primarily of infiltration/inflow, and stormwater flows. Under the current methodology, nonpoint source sewage flow is approximated by deducting estimated sanitary point source sewage flow identified for all for the communities from total annual influent sewage flow reaching the treatment plants. Non-point source sewage flow responsibility is allocated to the nonindustrial and industrial classes in total based on the proportionate number of individual user connections each class has to the sewage system. It is noted that identified nonpoint infiltration/inflow and stormwater sewage flow reaching the treatment plants is not representative of the total nonpoint source flow of the MWRA system, since some nonpoint source flow is overflowed to receiving waters through CSO structures before reaching treatment facilities.

Once the aggregate non-industrial class point and non-point source sewage flow reaching the treatment plants is established, it is used for determining a population equivalent sewage flow by dividing total non-industrial sewage flow responsibility by total system contributing population. In 1984, the total non-industrial user population equivalent sewage volume, including point and non-point sources reaching the treatment plants, was 227 gallons per capita per day (gpcd). Division of an industry's sewage volume by 227 gpcd results in that industry's number of volume population equivalents. Similar determinations are made to establish population equivalent values for capacity, or rate of flow, and for suspended solids strength parameters. The summation of each member community's population and population equivalents of industrial wastes are determined for volume, capacity and suspended solids, and ratios of individual member community population plus population equivalents to total system population plus population equivalents developed. These ratios serve as the basis for distributing the functionally allocated volume, capacity and suspended solids costs of sewage service.

When each community's assessment ratios for operation and maintenance and debt related costs of service are determined and the estimated sewage costs assessment developed, the Sewerage Division provides each municipality with a detailed summarization of their assessment. The breakdown of total assessed costs is detailed by broad customer classification, and information which may be used by each community to further distribute MWRA sewage system costs within the community is shown. The distribution of MWRA assessed costs by each community to end users is not controlled by the MWRA.

The major portion of most communities' annual charges are related to the non-industrial users in each community. In fiscal year 1987, approximately 92 percent of the total costs of sewage service were assigned to non-industrial class users under the existing method. The remaining eight percent was assigned to large commercial and industrial users in each community. While the current methodology assigns cost responsibilities to large commercial and industrial users based upon their sewage volume, capacity and strength, member community non-industrial class assessments are based upon community contributing and census population figures. That is, while estimated sewage flows are established for non-industrial users in each community in a fashion similar to that used for industrial users, it is not used for determining assessments due to the population and population equivalent cost determination procedures which were originally incorporated into the assessment process as a result of Chapter 814 requirements.

The result of this procedure is to inherently assume that every person in each community contributes exactly the same quantity and quality of sewage, even though gathered water usage and other data indicate significant variations in per capita sanitary sewage discharges among member communities exist.

Table IV.1 on the next page presents FY 1987 sewer charges using Alternative S-1.

Advantages and Disadvantages

Advantages

- No change is required in established methodology and data collection requirements. (However, cost allocation program would require limited alteration.)
- Member communities are accustomed to the existing process and use of the population and population equivalent concept as a basis for annual charge.
- Change in level of costs charged to communities would generally occur only as a result of inflation in cost level or cost increases from additional system improvements.
- Existing system properly recognizes industrial class sanitary sewage related costs of service.
- Existing system cost allocation procedures can be readily expanded to include additional functional cost components when secondary treatment is started.
- Assignment of debt related costs to communities on the basis of census population recognizes to a degree that current unsewered areas receive some benefit from having the potential to connect to a sewer system.

Disadvantages

- Existing system does not recognize variation in non-industrial class sanitary sewage discharges among communities. The population method assumes each person in every municipality is equal. Data indicates the contrary. Community sanitary sewage costs are not assigned in proportion to discharge.
- Existing system assigns non-point source sewage cost responsibility in proportion to population. Non-point source sewage cost responsibility may be better assigned using other bases.
- Existing system results in communities with below average sewage discharges per population to subsidize those with above average discharges.
- Existing system assigns debt related costs to communities based on census population. Communities with a high percentage of unsewered population pay for services not directly received.

ALTERNATIVE S-1

MASSACHUSETTS WATER RESOURCES AUTHORITY FISCAL YEAR 1987 SEWAGE COST ASSESSMENTS UNDER EXISTING POPULATION AND POPULATION EQUIVALENT METHODOLOGY

COMMUNITY NAME	POPULATION EQUIVALENT METHOD
	$
ARLINGTON	1,382,130
ASHLAND	216,077
BEDFORD	375,367
BELMONT	751,673
BOSTON	18,101,887
BRAINTREE	1,068,290
BROOKLINE	1,591,118
BURLINGTON	687,781
CAMBRIDGE	3,279,918
CANTON	445,263
CHELSEA	748,901
DEDHAM	657,110
EVERETT	1,189,487
FRAMINGHAM	1,735,358
HINGHAM	166,474
HOLBROOK	121,894
LEXINGTON	809,468
MALDEN	1,575,883
MEDFORD	1,710,212
MELROSE	869,801
MILTON	733,501
NATICK	754,010
NEEDHAM	760,080
NEWTON	2,466,126
NORWOOD	983,073
QUINCY	2,496,619
RANDOLPH	684,427
READING	567,147
REVERE	1,187,996
SOMERVILLE	2,263,649
STONEHAM	618,459
STOUGHTON	484,706
WAKEFIELD	718,870
WALPOLE	419,946
WALTHAM	1,933,453
WATERTOWN	1,019,319
WELLESLEY	715,909
WESTWOOD	234,631
WEYMOUTH	1,276,685
WILMINGTON	255,872
WINCHESTER	559,528
WINTHROP	561,091
WOBURN	1,195,811
TOTAL MWRA	60,375,000

- Change to some computerized programs is necessary to accommodate new cost accounting system.

- Existing system does not recognize potential differences in non-point source sewage discharges between combined and separated sewer areas.

- P&PE method is not a widely used cost determination method.

- Explanation of charge determination is difficult. Impact of any change in sewage discharges by communities cannot be readily determined.

- Existing system does not send a price signal which might encourage sewage discharge reductions.

ALTERNATIVE S-2 - UNIT COST

Alternative S-2 develops sewage charges under the "unit cost" approach. This alternative methodology was presented to the MWRA Board of Directors during the August 13, 1986 Board meeting, at which four options were discussed under the unit cost method for assigning non-point sewage units of service and related cost responsibility to member communities. The four methods for determining non-point source sewage cost responsibility discussed were:

- In proportion to the number of each community's customer connections to total system customer connections (100 percent customer connection).

- In proportion to each community's sanitary sewage volume to total system sanitary sewage volume (100 percent sanitary sewage volume).

- Based on a combination of 50 percent customer connections and 50 percent sanitary sewage volume.

- In proportion to each community's sanitary sewage (volume, capacity, and suspended solids) units of service to total system sanitary sewage units of service.

Based upon discussion of the above methods, three Unit Cost options were selected and analyzed as alternatives for the Board to consider. Alternative unit cost wholesale sewer rate methodologies analyzed were:

Option 1. Assignment of non-point source sewage units of service in proportion to the number of each community's customer connections to total system customer connections (100 percent customer connection). See Table IV.2 for FY 1987 community sewer charges under this option.

Option 2. Assignment of non-point source sewage units of service, 75 percent in proportion to the number of each community's customer connections to total system customer connections and 25 percent in proportion to each community's sanitary sewage volume to total system sanitary sewage volume. Table IV.3 presents FY 1987 sewer charges for Option 2.

Option 3. Assignment of non-point source sewage units of service, 50 percent in proportion to the number of each community's customer connections to total system customer connections and 50 percent in proportion to each community's sanitary sewage volume to total system sanitary sewage volume. Table IV.4 presents FY 1987 sewer charges for this option.

Tables IV.2, IV.3 and IV.4 are located on the following pages.

Advantages and Disadvantages

Advantages

- Unit cost approach is a commonly used cost determination method recognized by professional organizations.
- Uses same functional cost allocation steps as existing methodology.
- Utilizes annual water usage, sewer connection and other data to estimate sanitary sewage units of service, which represents a better measure for determining cost responsibility than does population.
- Utilizes alternate basis for determining non-point source sewage units of service, which is believed more appropriate than using population as a basis.
- Charges are in proportion to estimated community sewage discharges. Total community units of service are the basis for the annual charge. This basis more accurately reflects community sewage discharges and related cost responsibility.
- Unit costs are expressed more easily in terms routinely used for rate making and could be utilized by communities at the retail level.
- Each community is charged costs based on the same unit costs.
- Unit costs provide a price signal which communities can use to evaluate decisions to reduce sewage discharges.
- The method would be easier to explain to communities and for communities to understand.
- Many of the existing P&PE data collection, procedures, and to a more limited extent, computer programs, can be adapted for use under the unit cost method.
- The unit cost allocation procedures can be readily expanded to include additional cost allocation parameters or be used when MWRA meters community sewage discharges to its system.
- The method complies with EPA requirements, and the objectives of MWRA authorizing legislation.

Table IV.2

ALTERNATIVE S-2, Option 1

MASSACHUSETTS WATER RESOURCES AUTHORITY
COMPARISON OF FISCAL YEAR 1987 SEWAGE COST ASSESSMENTS UNDER EXISTING AND PROPOSED METHODOLIGIES

COMMUNITY NAME	POPULATION EQUIVALENT METHOD	UNIT COST METHOD OPTION 1 100% CONNECTION	PERCENTAGE CHANGE
	$	$	%
ARLINGTON	1,382,130	1,338,275	96.83%
ASHLAND	216,077	243,915	112.88%
BEDFORD	375,367	335,840	89.47%
BELMONT	751,673	784,076	104.31%
BOSTON	18,101,887	18,922,635	104.53%
BRAINTREE	1,068,290	1,092,453	102.26%
BROOKLINE	1,591,118	1,218,491	76.58%
BURLINGTON	687,781	811,144	117.94%
CAMBRIDGE	3,279,918	2,509,235	76.50%
CANTON	445,263	433,640	97.39%
CHELSEA	748,901	541,850	72.35%
DEDHAM	657,110	633,761	96.45%
EVERETT	1,189,487	1,239,976	104.24%
FRAMINGHAM	1,735,358	1,942,625	111.94%
HINGHAM	166,474	153,905	92.45%
HOLBROOK	121,894	77,491	63.57%
LEXINGTON	809,468	1,049,834	129.69%
MALDEN	1,575,883	1,377,217	87.39%
MEDFORD	1,710,212	1,533,505	89.67%
MELROSE	869,801	939,222	107.98%
MILTON	733,501	798,600	108.88%
NATICK	754,010	811,633	107.64%
NEEDHAM	760,080	954,024	125.52%
NEWTON	2,466,126	2,769,244	112.29%
NORWOOD	983,073	914,624	93.04%
QUINCY	2,496,619	2,512,136	100.62%
RANDOLPH	684,427	702,663	102.66%
READING	567,147	631,533	111.35%
REVERE	1,187,996	1,084,314	91.27%
SOMERVILLE	2,263,649	2,074,335	91.64%
STONEHAM	618,459	642,230	103.84%
STOUGHTON	484,706	315,853	65.16%
WAKEFIELD	718,870	766,665	106.65%
WALPOLE	419,946	353,961	84.29%
WALTHAM	1,933,453	1,779,622	92.04%
WATERTOWN	1,019,319	994,475	97.56%
WELLESLEY	715,909	794,642	111.00%
WESTWOOD	234,631	229,470	97.80%
WEYMOUTH	1,276,685	1,274,312	99.81%
WILMINGTON	255,872	124,398	48.62%
WINCHESTER	559,528	744,349	133.03%
WINTHROP	561,091	512,889	91.41%
WOBURN	1,195,811	1,410,494	117.95%
TOTAL MWRA	60,375,000	60,375,555	100.00%

ALTERNATIVE S-2, Option 2

MASSACHUSETTS WATER RESOURCES AUTHORITY COMPARISON OF FISCAL YEAR 1987 SEWAGE COST ASSESSMENTS UNDER EXISTING AND PROPOSED METHODOLIGIES

COMMUNITY NAME	POPULATION EQUIVALENT METHOD	UNIT COST METHOD OPTION 2 75% CONNECTION 25% VOLUME	PERCENTAGE CHANGE
	$	$	%
ARLINGTON	1,382,130	1,240,671	89.77%
ASHLAND	216,077	237,651	109.98%
BEDFORD	375,367	374,423	99.75%
BELMONT	751,673	742,088	98.72%
BOSTON	18,101,887	19,357,236	106.93%
BRAINTREE	1,068,290	1,031,085	96.52%
BROOKLINE	1,591,118	1,295,739	81.44%
BURLINGTON	687,781	827,695	120.34%
CAMBRIDGE	3,279,918	2,818,708	85.94%
CANTON	445,263	436,656	98.07%
CHELSEA	748,901	564,480	75.37%
DEDHAM	657,110	615,531	93.67%
EVERETT	1,189,487	1,331,082	111.90%
FRAMINGHAM	1,735,358	1,964,044	113.18%
HINGHAM	166,474	138,326	83.09%
HOLBROOK	121,894	75,973	62.33%
LEXINGTON	809,468	997,767	123.26%
MALDEN	1,575,883	1,331,383	84.48%
MEDFORD	1,710,212	1,436,094	83.97%
MELROSE	869,801	886,543	101.92%
MILTON	733,501	746,009	101.71%
NATICK	754,010	763,728	101.29%
NEEDHAM	760,080	908,774	119.56%
NEWTON	2,466,126	2,685,269	108.89%
NORWOOD	983,073	915,698	93.15%
QUINCY	2,496,619	2,390,535	95.75%
RANDOLPH	684,427	610,794	89.24%
READING	567,147	585,764	103.28%
REVERE	1,187,996	1,013,722	85.33%
SOMERVILLE	2,263,649	2,160,749	95.45%
STONEHAM	618,459	622,860	100.71%
STOUGHTON	484,706	276,727	57.09%
WAKEFIELD	718,870	711,121	98.92%
WALPOLE	419,946	391,199	93.15%
WALTHAM	1,933,453	1,887,752	97.64%
WATERTOWN	1,019,319	945,069	92.72%
WELLESLEY	715,909	736,833	102.92%
WESTWOOD	234,631	213,651	91.06%
WEYMOUTH	1,276,685	1,192,517	93.41%
WILMINGTON	255,872	166,429	65.04%
WINCHESTER	559,528	726,270	129.80%
WINTHROP	561,091	484,059	86.27%
WOBURN	1,195,811	1,536,935	128.53%
TOTAL MWRA	60,375,000	60,375,636	100.00%

Table IV.4

ALTERNATIVE S-2, Option 3

MASSACHUSETTS WATER RESOURCES AUTHORITY
COMPARISON OF FISCAL YEAR 1987 SEWAGE COST ASSESSMENTS UNDER EXISTING AND PROPOSED METHODOLIGIES

COMMUNITY NAME	POPULATION EQUIVALENT METHOD	UNIT COST METHOD OPTION 3 50% CONNECTION 50% VOLUME	PERCENTAGE CHANGE
	$	$	%
ARLINGTON	1,382,130	1,143,067	82.70%
ASHLAND	216,077	231,419	107.10%
BEDFORD	375,367	413,006	110.03%
BELMONT	751,673	700,011	93.13%
BOSTON	18,101,887	19,791,743	109.34%
BRAINTREE	1,068,290	969,777	90.78%
BROOKLINE	1,591,118	1,373,014	86.29%
BURLINGTON	687,781	844,154	122.74%
CAMBRIDGE	3,279,918	3,128,122	95.37%
CANTON	445,263	439,611	98.73%
CHELSEA	748,901	587,022	78.38%
DEDHAM	657,110	597,213	90.88%
EVERETT	1,189,487	1,422,187	119.56%
FRAMINGHAM	1,735,358	1,985,403	114.41%
HINGHAM	166,474	122,808	73.77%
HOLBROOK	121,894	74,455	61.08%
LEXINGTON	809,468	945,789	116.84%
MALDEN	1,575,883	1,285,582	81.58%
MEDFORD	1,710,212	1,338,651	78.27%
MELROSE	869,801	833,803	95.86%
MILTON	733,501	693,269	94.52%
NATICK	754,010	715,910	94.95%
NEEDHAM	760,080	863,463	113.60%
NEWTON	2,466,126	2,601,266	105.48%
NORWOOD	983,073	916,892	93.27%
QUINCY	2,496,619	2,268,934	90.88%
RANDOLPH	684,427	518,925	75.82%
READING	567,147	540,055	95.22%
REVERE	1,187,996	943,190	79.39%
SOMERVILLE	2,263,649	2,247,252	99.28%
STONEHAM	618,459	603,550	97.59%
STOUGHTON	484,706	237,568	49.01%
WAKEFIELD	718,870	655,516	91.19%
WALPOLE	419,946	428,496	102.04%
WALTHAM	1,933,453	1,995,882	103.23%
WATERTOWN	1,019,319	895,723	87.87%
WELLESLEY	715,909	678,963	94.84%
WESTWOOD	234,631	197,771	84.29%
WEYMOUTH	1,276,685	1,110,871	87.01%
WILMINGTON	255,872	208,369	81.43%
WINCHESTER	559,528	708,252	126.58%
WINTHROP	561,091	455,168	81.12%
WOBURN	1,195,811	1,663,464	139.11%
TOTAL MWRA	60,375,000	60,375,585	100.00%

Disadvantages

- A change to this methodology may result in significant changes in level of some community charges.

- Method does not recognize potential differences in non-point source sewage discharges between combined and separated sewer areas.

- Method for assigning non-point source sewage units of service reaching the treatment plant to communities may not reflect the actual level of such discharges from each community. To that extent, annual charges based on this component of units of service may overstate or understate cost responsibility to some degree.

- If MWRA installs sewage meters, another change in methodology procedures will be required beyond adoption of this method. Frequent change in procedures may tend to confuse customer understanding of the process.

- Changes in some existing P&PE methodology and computer programs will be necessary to implement this method.

Alternative S-3 - Unit Cost Method With CSO Option

Alternative S-3 is also a unit cost approach. However, under this method combined sewer overflow (CSO) facility related costs are separately identified for charges to member communities. Under Alternative S-2, costs are assigned to three functional cost component parameters, including volume, capacity and suspended solids. In Alternative S-3, costs related to CSO facilities are deducted for the volume and capacity costs components established for Alternative S-2 and included under a separate CSO facility functional cost component. Responsibility for CSO facility cost is next assigned to combined sewer areas and separated sewer areas.

Based on engineering judgment and analyzing readily available data, the CSO facility costs have been allocated on a 50/50 basis to combined and separated sewer areas.

CSO costs are allocated to all communities since it is appropriate to assign CSO facility costs to both combined sewer and separated sewer communities given the age and general condition of the communities' sewer systems. CSO facility costs have been allocated to all communities because it is likely that excessive infiltration/inflow (I/I) from separated sewer communities contributes to the need for CSO facilities. Since I/I from these communities reduces the capacity in downstream sewers which would otherwise be available to handle combined and separated sewer areas, the costs are charged to each community in proportion to each communities combined sewer and separated sewer acreage to total system combined sewer and separated sewer acreage.

Under Alternative S-3, remaining non-point source sewage related costs beyond those related to CSO facilities are charged to communities in accordance with the Unit Cost (S-2) Option 3 (i.e., 50 percent customer connections and 50 percent sanitary sewer volume) in accordance with MWRA staff direction. Table IV.5, located on the next page, presents community sewer charges using Alternative S-3.

Table IV.5

ALTERNATIVE S-3

MASSACHUSETTS WATER RESOURCES AUTHORITY
COMPARISON OF FISCAL YEAR 1987 SEWAGE COST ASSESSMENTS UNDER EXISTING AND PROPOSED METHODOLIGIES

COMMUNITY NAME	POPULATION EQUIVALENT METHOD	UNIT COST METHOD WITH CSO OPTION	PERCENTAGE CHANGE
	$	$	%
ARLINGTON	1,382,130	1,126,406	81.50%
ASHLAND	216,077	229,133	106.04%
BEDFORD	375,367	407,504	108.56%
BELMONT	751,673	693,480	92.26%
BOSTON	18,101,887	19,850,408	109.66%
BRAINTREE	1,068,290	968,665	90.67%
BROOKLINE	1,591,118	1,390,763	87.41%
BURLINGTON	687,781	845,261	122.90%
CAMBRIDGE	3,279,918	3,179,408	96.94%
CANTON	445,263	446,005	100.17%
CHELSEA	748,901	659,479	88.06%
DEDHAM	657,110	592,343	90.14%
EVERETT	1,189,487	1,384,341	116.38%
FRAMINGHAM	1,735,358	1,963,220	113.13%
HINGHAM	166,474	122,862	73.80%
HOLBROOK	121,894	72,894	59.80%
LEXINGTON	809,468	947,485	117.05%
MALDEN	1,575,883	1,261,988	80.08%
MEDFORD	1,710,212	1,317,750	77.05%
MELROSE	869,801	820,084	94.28%
MILTON	733,501	686,696	93.62%
NATICK	754,010	715,592	94.90%
NEEDHAM	760,080	861,559	113.35%
NEWTON	2,466,126	2,579,719	104.61%
NORWOOD	983,073	908,759	92.44%
QUINCY	2,496,619	2,230,989	89.36%
RANDOLPH	684,427	521,918	76.26%
READING	567,147	545,388	96.16%
REVERE	1,187,996	928,565	78.16%
SOMERVILLE	2,263,649	2,352,585	103.93%
STONEHAM	618,459	598,508	96.77%
STOUGHTON	484,706	239,219	49.35%
WAKEFIELD	718,870	654,859	91.10%
WALPOLE	419,946	422,741	100.67%
WALTHAM	1,933,453	1,964,444	101.60%
WATERTOWN	1,019,319	880,598	86.39%
WELLESLEY	715,909	686,039	95.83%
WESTWOOD	234,631	199,704	85.11%
WEYMOUTH	1,276,685	1,108,220	86.80%
WILMINGTON	255,872	202,748	79.24%
WINCHESTER	559,528	721,615	128.97%
WINTHROP	561,091	446,404	79.56%
WOBURN	1,195,811	1,638,910	137.05%
TOTAL MWRA	60,375,000	60,375,255	100.00%

Advantages and Disadvantages

Advantages

- Unit cost approach is a commonly used cost determination method recognized by professional organizations.
- Uses same functional cost allocation steps as existing methodology.
- Utilizes annual water usage, sewer connection and other data to estimate sanitary sewage units of service, which represents a better measure for determining cost responsibility than does population.
- Utilizes alternate basis for determining non-point source sewage units of service and responsibility for CSO storm facility costs which is believed more appropriate than using population as a basis.
- Charges are in proportion to estimated community sewage discharges. Total community units of service are the basis for annual charges. This basis more accurately reflects community sewage discharges and related cost responsibility.
- Unit costs are expressed in terms routinely used for rate making and could be utilized by communities at the retail level.
- Each community is charged costs based on the same unit costs.
- Unit costs provide a price signal which communities can use to evaluate decisions to reduce sewage discharges.
- The method would be easier to explain to communities and for communities to understand.
- Many of the existing P&PE data collection, procedures, and to a more limited extent, computer programs, can be adapted for use under the unit cost method.
- The unit cost method allocation procedures can be readily expanded to include additional cost allocation parameters, such as, "storm facilities", BOD, etc.
- The method complies with EPA requirements and the objectives of MWRA authorizing legislation.
- Combined and separated sewer area cost responsibility for CSO facilities is recognized.
- Addition of the storm facility cost component and change to cost allocation procedures is relatively simple.
- Use of sewered acreage as the basis to assess CSO related costs is available and requires no additional data gathering procedures on the part of the staff.

- While CSO facility related costs are low today, future CSO costs could be much higher as costly facilities are added.

- Implementation of a CSO charge sends a price signal to communities to reduce non-point source discharges through sewer rehabilitation.

- This method of cost allocation could be altered if MWRA meters community discharges.

Disadvantages

- A change in methodology may result in significant changes in level of some community charges.

- Method for assigning non-point source sewage units of service reaching the treatment plant to communities may not reflect the actual level of such discharges from each community. To that extent annual charges based on this component of units of service may overstate or understate cost responsibility to some degree.

- If MWRA installs sewage meters, another change in methodology procedures will be required beyond adoption of this method. Frequent changes in procedures may tend to confuse customer understanding of the process.

- Changes in some existing P&PE procedures and computer programs will be necessary to implement this method.

- While the present allocation of CSO storm facility cost to the combined and the separated sewer area functional cost components is not arbitrary, it is based on somewhat limited studies. More in-depth analysis may be required to verify the indicated allocation basis.

- Use of sewered acreage does not recognize likely differential in individual community runoff coefficients, or age, length and condition of sewers, which all affect the level of stormwater and other I/I that enters the system.

- This method penalizes combined sewer areas to some extent today for having built combined sewers long ago when it was accepted construction practice and the future impact of that decision unknown.

The community sewer charges for each alternative presented in previous tables are summarized on Table IV.6, which appears on the following page.

SUMMARY TABLE

MASSACHUSETTS WATER RESOURCES AUTHORITY
COMPARISON OF FISCAL YEAR 1987 SEWAGE COST
ASSESSMENTS UNDER EXISTING AND PROPOSED METHODOLIGIES

		UNIT COST METHOD				UNIT COST METHOD			
COMMUNITY NAME	POPULATION EQUIVALENT METHOD	OPTION 1 100% CONNECTION	OPTION 2 75% CONNECTION 25% VOLUME	OPTION 3 50% CONNECTION 50% VOLUME	UNIT COST METHOD WITH CSO OPTION	OPTION 1 100% CONNECTION	OPTION 2 75% CONNECTION 25% VOLUME	OPTION 3 50% CONNECTION 50% VOLUME	UNIT COST METHOD WITH CSO OPTION
	$	$	$	$	$	%	%	%	%
ARLINGTON	1,382,130	1,338,275	1,240,671	1,143,067	1,126,406	96.83%	89.77%	82.70%	81.50%
ASHLAND	216,077	243,915	237,651	231,419	229,133	112.88%	109.98%	107.10%	106.04%
BEDFORD	375,367	335,840	374,423	413,006	407,504	89.47%	99.75%	110.03%	108.56%
BELMONT	751,673	784,076	742,088	700,011	693,480	104.31%	98.72%	93.13%	92.26%
BOSTON	18,101,887	18,922,635	19,357,236	19,791,743	19,850,408	104.53%	106.93%	109.34%	109.66%
BRAINTREE	1,068,290	1,092,453	1,031,085	969,777	968,665	102.26%	96.52%	90.78%	90.67%
BROOKLINE	1,591,118	1,218,491	1,295,739	1,373,014	1,390,763	76.58%	81.44%	86.29%	87.41%
BURLINGTON	687,781	811,144	827,695	844,154	845,261	117.94%	120.34%	122.74%	122.90%
CAMBRIDGE	3,279,918	2,509,235	2,818,708	3,128,122	3,179,408	76.50%	85.94%	95.37%	96.94%
CANTON	445,263	433,640	436,656	439,611	446,005	97.39%	98.07%	98.73%	100.17%
CHELSEA	748,901	541,850	564,480	587,022	659,479	72.35%	75.37%	78.38%	88.06%
DEDHAM	657,110	633,761	615,531	597,213	592,343	96.45%	93.67%	90.88%	90.14%
EVERETT	1,189,487	1,239,976	1,331,082	1,422,187	1,384,341	104.24%	111.90%	119.56%	116.38%
FRAMINGHAM	1,735,358	1,942,625	1,964,044	1,985,403	1,963,220	111.94%	113.18%	114.41%	113.13%
HINGHAM	166,474	153,905	138,326	122,808	122,862	92.45%	83.09%	73.77%	73.80%
HOLBROOK	121,894	77,491	75,973	74,455	72,894	63.57%	62.33%	61.08%	59.80%
LEXINGTON	809,468	1,049,834	997,767	945,789	947,485	129.69%	123.26%	116.84%	117.05%
MALDEN	1,575,883	1,377,217	1,331,383	1,285,582	1,261,988	87.39%	84.48%	81.58%	80.08%
MEDFORD	1,710,212	1,533,505	1,436,094	1,338,651	1,317,750	89.67%	83.97%	78.27%	77.05%
MELROSE	869,801	939,222	886,543	833,803	820,084	107.98%	101.92%	95.86%	94.28%
MILTON	733,501	798,600	746,009	693,269	686,696	108.88%	101.71%	94.52%	93.62%
NATICK	754,010	811,633	763,728	715,910	715,592	107.64%	101.29%	94.95%	94.90%
NEEDHAM	760,080	954,024	908,774	863,463	861,559	125.52%	119.56%	113.60%	113.35%
NEWTON	2,466,126	2,769,244	2,685,269	2,601,266	2,579,719	112.29%	108.89%	105.48%	104.61%
NORWOOD	983,073	914,624	915,698	916,892	908,759	93.04%	93.15%	93.27%	92.44%
QUINCY	2,496,619	2,512,136	2,390,535	2,268,934	2,230,989	100.62%	95.75%	90.88%	89.36%
RANDOLPH	684,427	702,663	610,794	518,925	521,918	102.66%	89.24%	75.82%	76.26%
READING	567,147	631,533	585,764	540,055	545,388	111.35%	103.28%	95.22%	96.16%
REVERE	1,187,996	1,084,314	1,013,722	943,190	928,565	91.27%	85.33%	79.39%	78.16%
SOMERVILLE	2,263,649	2,074,335	2,160,749	2,247,252	2,352,585	91.64%	95.45%	99.28%	103.93%
STONEHAM	618,459	642,230	622,860	603,550	598,508	103.84%	100.71%	97.59%	96.77%
STOUGHTON	484,706	315,853	276,727	237,568	239,219	65.16%	57.09%	49.01%	49.35%
WAKEFIELD	718,870	766,665	711,121	655,516	654,859	106.65%	98.92%	91.19%	91.10%
WALPOLE	419,946	353,961	391,199	428,496	422,741	84.29%	93.15%	102.04%	100.67%
WALTHAM	1,933,453	1,779,622	1,887,752	1,995,882	1,964,444	92.04%	97.64%	103.23%	101.60%
WATERTOWN	1,019,319	994,475	945,069	895,723	880,598	97.56%	92.72%	87.87%	86.39%
WELLESLEY	715,909	794,642	736,833	678,963	686,039	111.00%	102.92%	94.84%	95.83%
WESTWOOD	234,631	229,470	213,651	197,771	199,704	97.80%	91.06%	84.29%	85.11%
WEYMOUTH	1,276,685	1,274,312	1,192,517	1,110,871	1,108,220	99.81%	93.41%	87.01%	86.80%
WILMINGTON	255,872	124,398	166,429	208,369	202,748	48.62%	65.04%	81.43%	79.24%
WINCHESTER	559,528	744,349	726,270	708,252	721,615	133.03%	129.80%	126.58%	128.97%
WINTHROP	561,091	512,889	484,059	455,168	446,404	91.41%	86.27%	81.12%	79.56%
WOBURN	1,195,811	1,410,494	1,536,935	1,663,464	1,638,910	117.95%	128.53%	139.11%	137.05%
TOTAL MWRA	60,375,000	60,375,555	60,375,636	60,375,585	60,375,255	100.00%	100.00%	100.00%	100.00%

ALTERNATIVE WATER RATE METHODOLOGIES

This section of the report addresses various alternative wholesale water rate methodologies which may be considered for future MWRA water system charges to both fully and partially served member communities. These wholesale methodologies represent different methods of charging member communities for water usage. They include the current (average cost) methodology, a marginal cost (old water/new water) methodology, and an inverted (increasing) block methodology. A description of each of these methodologies, including its respective advantages and disadvantages and the determination of the applicable billing units, is presented below.

ALTERNATIVE W-1 - AVERAGE COST (CURRENT METHODOLOGY)

Under the current average cost methodology, alternative W-1, MWRA water system costs are recovered from member communities in proportion to annual metered water consumption using average costs. Net annual water system costs, including operation and maintenance expenditures and debt service costs, are divided by the sum of the actual annual metered water usage for all fully and partially served communities to derive an annual average unit cost. Annual water revenue from contractual customers (primarily western communities) is credited against the total annual water system revenue requirement to determine the net revenue requirement or cost to be recovered from the fully and partially served communities.

For fiscal year 1987, the projected water system revenue requirement to be recovered from fully and partially served communities amounts to $30,351,000. The total annual metered water usage for these communities for calendar year 1985, which is the most recent consumption data available, amounts to 255.846 million gallons per day (mgd) or 93,384 million gallons (mg). Dividing the projected cost by the total metered units results in an average unit cost applicable for fiscal year 1987 of $325/mg. Application of the average unit cost to the calendar year 1985 metered water usage of each community yields the annual revenue under the current methodology for each community. This methodology is used in this report as the base alternative against which other alternatives are measured and compared.

Advantages and Disadvantages

Advantages:

- Readily understood by communities since methodology has been practiced for many years.
- Relatively simple and straightforward to administer.
- Revenues from each community would be relatively stable over time and not as subject to fluctuations attendant with the other two methods.
- Overall revenue stream to MWRA would be more stable and dependable.

Disadvantages:

- Does not strongly promote conservation.

- Does not recognize variable peaking (maximum day/maximum hour) demands imposed on the system by various communities.

- Does not recognize responsibility for new, more costly supply necessary to support growth.

ALTERNATIVE W-2 - MARGINAL COST (OLD WATER/NEW WATER)

The premise underlying Alternative W-2, the marginal cost methodology, is that the existing source of supply of 300 mgd has essentially been fully utilized by the existing customer base for the past 10 years. During this period, increased water usage by certain communities has been offset by reduced usage by other communities. The absence of a long-term, severe drought during the past decade has enabled the existing source of supply to remain adequate. It is unlikely that the existing source of supply will be able to continue to meet the water usage requirements of the existing and/or expanded customer base in the future.

Accordingly, planning has been initiated by the MWRA for the development of additional sources of supply to augment the existing supply. These new sources of supply are significantly more costly per unit of supply than is the existing source of supply.

The marginal cost methodology, as set forth in this report, is intended to charge the cost of this more expensive new supply to those communities whose usage is increasing and is thereby creating the need for the new supply. Conversely, under the marginal cost approach, a credit would be given to those communities whose usage is declining, which in essence is providing a source of supply for use by those communities whose usage is increasing. The concept of charging for the new water supply required to provide for increased usage at a higher or marginal cost, relative to the existing (older and less expensive) source of supply, may also be thought of in terms of an "old water/new water" rate methodology. However, for purposes of this report, the term "marginal cost" is used hereinafter.

Under the marginal cost methodology there are two options regarding the determination of the marginal cost of new source of supply developed in this report. The two methods for determining the marginal cost of new water supply are:

- Use of proposed Sudbury Treatment Plant costs (capital and operating) to determine the marginal cost of new supply.

- Use of weighted average of proposed Sudbury Treatment Plant costs and proposed Demand Management costs (Domestic Device Retrofit and Leak Detection and Repair) to determine the marginal cost of new supply.

The calculation of marginal costs of supply for the two options under this alternative are based on the projected costs (both capital and operating) and estimated incremental supply yields of the various source of supply projects as set forth in the MWRA "Capital Expenditure Budget and Facilities Program, FY 1986 - FY 1988" dated August 5, 1985. Capital costs associated with the design and construction of the source of supply projects were annualized by assuming bond financing of these projects at 8 percent interest, 30 year equal annual principal and interest payments, with one year's principal and interest

(reserve fund requirements) and bond financing costs (estimated at two percent of the bond issue amount) being financed from bond proceeds. The resulting annual debt service costs plus estimated annual operation and maintenance expenses were divided by the projected supply yield of the project to determine the marginal cost of new supply. Table IV.7 on the following page shows the development of the total marginal cost of new source of supply for the two options.

Both options presented in this alternative reflect new source of supply projects which are relatively near term projects, that is, they are anticipated to be completed by approximately 1990. Two options have been developed since the full implementation of the Domestic Device Retrofit portion of the Demand Management program is somewhat dependent upon the success of the pilot program. If the MWRA ultimately chooses the marginal cost methodology for future rate implementation, it may elect to reflect the cost of the Sudbury Treatment Plant in the initial charges (optional). If the Demand Management programs are found to be successful, these costs can later be added to the marginal cost rate. Option 2 shows the resulting impact of including the Demand Management costs based on the current cost estimates. Longer range supply alternatives have not been included in this analysis, since the identification and selection of these alternatives is still in the preliminary planning stages.

Under the marginal cost alternative, there would be two separate charges. The first charge would be a base charge applicable to each community's actual current year (calendar year 1985) metered water usage. The second charge would be a marginal cost based charge applicable to the difference in the community's "normalized" current year usage and the community's base year usage. Normalized current year usage for each community would be computed annually based on a 10 year rolling average regression analysis. Each community's base year usage would be based on the average metered water usage for the period of 1976 through 1985. The base year usage for each community would remain fixed and would not be subject to change over time.

For those communities whose normalized current year usage is less than the base year usage, a credit would be due for, in essence, freeing up or creating additional supply through reduced usage. For those communities whose normalized current year usage exceeds their base year usage, a surcharge would be applicable.

Figure IV.1 shows an example of the determination of the billing units under the marginal cost methodology for the community of Lexington. The actual metered usage (in mgd) is summarized in the tabulation shown in Figure IV.1 for each of the calendar years 1976 through 1985. This data is graphically depicted in the figure by the square symbols. As shown at the bottom of the tabulation of the annual usage, the actual 10 year average usage for Lexington amounts to 5.728 mgd. In computing the overall system average daily usage for the 10 year period of 1976 through 1985, the average usage amounted to approximately 301 mgd, as compared to the 300 mgd reported from annual system yield. Accordingly, the 10 year average usage for the communities was adjusted downwards to recognize the current supply yield limitation, which for Lexington resulted in an adjusted 10 year average base year usage of 5.705 mgd or 2,082 mg. This usage level is graphically depicted by the broken line in Figure IV.1.

Table IV.7

DETERMINATION OF MARGINAL COST OF SUPPLY

Sudbury Treatment Plant

Total Annual Cost =
$2,302,000(a)(d) (Debt Service) + $919,000 (O&M) = $3,221,000
Annual Yield of Project =
17 mgd x 365 = 6,205 mg
Marginal Cost =
$3,221,000 ÷ 6,205 mg = $519/mg (Option 1)

Demand Management (Domestic Device Retrofit)

Total Annual Cost =
$6,303,000(b)(d) (Debt Service) + $157,000 (O&M) = $6,460,000
Annual Yield of Project =
16.5 mgd x 365 = 6,023 mg
Marginal Cost =
$6,460,000 ÷ 6,023 mg = $1,073/mg

Demand Management (Leak Detection and Repair)

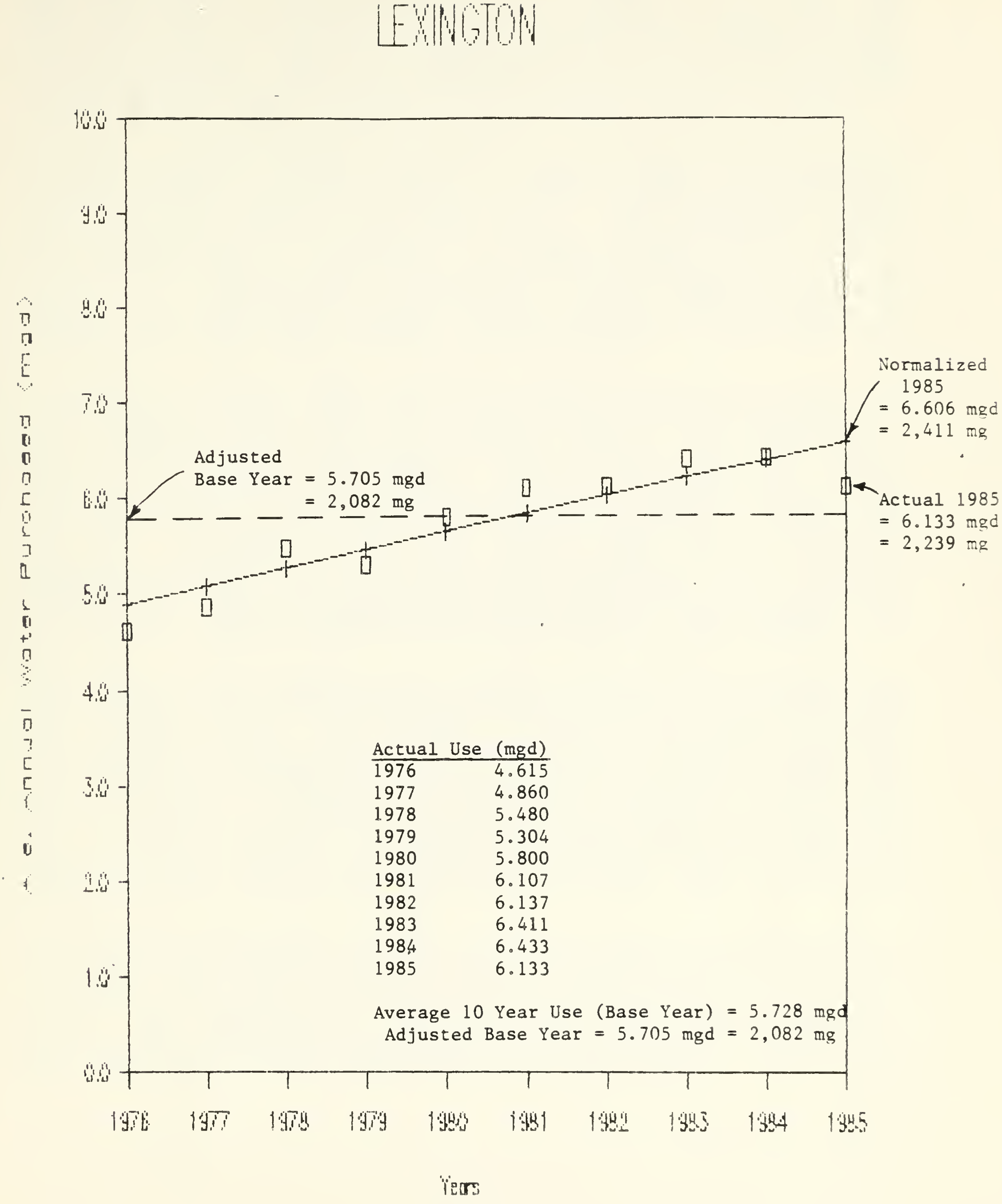
Total Annual Cost =
$209,000(c)(d) (Debt Service) + $1,000,000 (O&M) = $1,209,000
Annual Yield of Project =
7.9 mgd x 365 = 2,884 mg
Marginal Cost =
$1,209,000 ÷ 2,884 mg = $419/mg

Total All Projects

Total Annual Cost =
$3,221,000 + $6,460,000 + $1,209,000 = $10,890,000
Annual Yield of Projects =
6,205 mg + 6,023 mg + 2,884 mg = 15,112 mg
Marginal Cost =
$10,890,000 ÷ 15,112 mg = $721/mg (Option 2)

(a) Based on EIR, pilot study, design, and construction costs of $23,100,000.
(b) Based on purchase and installation costs of $63,240,000.
(c) Based cost of initial survey of $2,100,000.
(d) Debt service based on 8% interest and 30 year equal annual principal and interest; 2% financing costs and one year's debt service (reserve requirement) assumed to be financed from bond proceeds.

Figure IV.1



LEXINGTON

Normalized 1985
= 6.606 mgd
= 2,411 mg

Adjusted Base Year = 5.705 mgd
= 2,082 mg

Actual 1985
= 6.133 mgd
= 2,239 mg

Actual Use	(mgd)
1976	4.615
1977	4.860
1978	5.480
1979	5.304
1980	5.800
1981	6.107
1982	6.137
1983	6.411
1984	6.433
1985	6.133

Average 10 Year Use (Base Year) = 5.728 mgd
Adjusted Base Year = 5.705 mgd = 2,082 mg

mg = million gallons
mgd = million gallons per day

The adjusted 10 year average usage, as described above, was selected as the base year usage for each community since during the time period the total system yield has been consistently approached or exceeded. Also during this time frame various communities have initiated conservation programs, and the 10 year period gives a measure of recognition and credit to these communities for these programs. Again, it is emphasized that the base year usage for each community would be fixed at the level determined for the period of 1976-1985, since the existing supply is effectively fully utilized during that period.

The second aspect of billing units related to the marginal cost approach which is shown in Figure IV.1 is the "normalized" usage for 1985. The normalized usage for 1985 is determined using a linear regression analysis of usage during the 10 year period of 1976 through 1985. A new regression analysis would be performed each succeeding year using the most recent 10 years of usage history in order to determine the normalized usage for the year in question. The normalization process tends to level out annual variations and fluctuations in usage caused by such factors as weather (generally summertime rainfall and temperature), economy, and other variables. For Lexington, the normalized 1985 usage amounts to 6.606 mgd or 2,411 mg.

The trend line generated from the regression analysis is shown in Figure IV.1 as the upward sloping solid line. It is proposed that the billing units to which the marginal cost rate would be applicable would be the difference in the normalized current year usage (2,411 mg for 1985 for Lexington) and the base year usage (2,082 mg for Lexington). Using the normalized usage, rather than actual usage, tends not to over penalize a community for higher than "normal" use which may be caused by significant lawn irrigation during a hot, dry year. Conversely, lower than "normal" usage does not receive a significant windfall credit under this proposed methodology. If a community significantly changes its usage pattern and overall level of usage (either up or down), the linear regression/normalization process will recognize such changes over a period of time since a 10 year rolling average is proposed.

Table IV.8 on the following page summarizes the actual 1985 calendar year usage (Column 1), the adjusted base year usage (Column 3), the normalized 1985 usage (Column 4), and the difference in normalized 1985 usage and adjusted base year usage (Column 5) for each of the communities. The base charge under the marginal cost methodology would be applicable to the actual 1985 units shown in Column 1. The marginal cost charge would be applicable to the units shown in Column 5. A negative (bracketed) figure in Column 5, such as the (42 mg) for Arlington, means that the marginal cost charge applied to these units would result in a credit, or downwards adjustment in Arlington's bill for fiscal year 1987. This is due to a normalized 1985 usage which is less than the base year usage for this community.

The marginal cost charge used to determine the credit or surcharge for the difference in normalized current year usage and base year usage is computed by subtracting the imbedded current cost of supply based on fiscal year 1987 cost levels from the marginal cost of new supply computed for each of the two options. This determination of the net unit marginal cost charge for new supply assumes that the base charge applicable to current year's metered usage will include and recover the imbedded cost of existing supply.

SUMMARY OF BILLING UNITS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
						Inverted Block Method		
Community Name	Annual 1985 Use	Annual Base Year Use	Adjusted Base Year Use	Normalized 1985 Use	Difference in Normalized 1985 and Adjusted Base Year Use	1st Block 0%- 90%	2nd Block 90%-110%	3rd Block Over 110%
	mg	mg	mg	mg	mg	mg	mg	mg
Arlington	1,812	1.776	1.768	1.726	(42)	1.591	221	0
Belmont	1.025	1.071	1.066	1.075	9	959	66	0
Boston	43.510	48.718	48,519	42.815	(5.704)	43,510	0	0
Brookline	2.689	2.612	2.601	2.549	(52)	2.341	348	0
Chelsea	1,467	1,233	1.228	1,277	49	1.105	246	116
Everett	3.271	2.993	2.981	3.124	143	2.683	588	0
Lexington	2.239	2.091	2.082	2.411	329	1,874	365	0
Lynnfield Water Dist	138	148	147	141	(6)	132	6	0
Malden	1,906	2.113	2.104	1,778	(326)	1,894	12	0
Marblehead	740	800	796	730	(66)	716	24	0
Medford	2.798	3.178	3.165	2.998	(167)	2.798	0	0
Melrose	1.311	1.136	1.132	1.196	64	1.019	226	66
Milton	1,035	1.076	1.072	1.045	(27)	965	70	0
Nahant	164	152	151	149	(2)	136	28	0
Newton	3.687	4.104	4.088	3.845	(243)	3.679	8	0
Norwood	1.639	1,557	1.551	1.684	133	1.396	243	0
Quincy	4.019	4.074	4,058	4.017	(41)	3.652	367	0
Revere	1.676	1.667	1.660	1.604	(56)	1.494	182	0
Saugus	1,445	1.391	1.386	1.443	57	1.247	198	0
Somerville	3.785	3.417	3.403	3.552	149	3,063	681	41
Stoneham	1.296	1.307	1.302	1,336	34	1.172	124	0
Swampscott	715	695	693	675	(18)	624	91	0
Waltham	3.257	3.925	3.909	3.502	(407)	3,257	0	0
Watertown	1.252	1.591	1.584	1.283	(301)	1.252	0	0
Winthrop	735	769	766	734	(32)	689	46	0
Subtotal Fully Served	87,611	93.594	93.212	86,689	(6,523)	83,248	4,140	223
Cambridge	193	123	123	233	110	111	25	57
Canton	831	536	536	802	266	482	107	242
Lynn	824	639	639	902	263	575	128	121
Needham	196	358	358	316	(42)	196	0	0
Peabody	350	500	500	581	81	350	0	0
Wakefield	863	772	772	829	57	695	154	14
Wellesley	0	0	0	0	0	0	0	0
Weston	447	407	407	412	5	366	81	0
Winchester	876	574	574	741	167	517	115	244
Woburn	1.193	443	443	1.103	660	399	89	705
Subtotal Partial	5.773	4.352	4.352	5.919	1.567	3.691	699	1.383
Total All Above	93.384	97,946	97.564	92,608	(4.956)	86,939	4.839	1.606

Of the current average cost rate of $325/mg for fiscal year 1987, it has been determined that approximately $139/mg is related to existing source of supply. This figure may be subject to further refinement based upon subsequent discussions with MWRA staff as to specifically what facilities are considered to be source of supply related. The total marginal cost of the Sudbury Treatment Plan supply (Option 1) is currently estimated to be $519/mg. Deduction of the imbedded cost of existing supply results in a net charge of $380/mg, which would be applicable to the difference in each community's normalized current year usage and the base year usage. For Option 2 of this alternative, the total marginal cost of new supply amounts to $721/mg. Deducting the cost of existing source of supply from the total marginal cost of new supply results in a net charge of $582/mg.

Based upon the comparison of normalized calendar year 1985 water usage and the base year water usage for all communities, there would be an overall net credit due for the water system as a whole, due to the general reduction in water usage relative to the base year. In order to recover the total revenue requirements applicable to the water system, the base charge, applicable to each community's actual metered water usage for calendar year 1985, needs to be increased above the system average cost of $325/mg. Based upon the credit computed using the marginal cost charge for Option 1, the necessary base charge required amounts to $346/mg. Under Option 2, the base charge necessary to recover total costs, after reflecting the credits for the marginal cost under this option, amounts to $356/mg.

The charges under the marginal cost methodology, which would be applicable for fiscal year 1987 cost level and calendar year 1985 units, are summarized below:

	Base Charge Applicable to FY 1985 Actual Metered Units	**Marginal Cost Charge Applicable to Normalized FY 1985 Units Less Base Year Units**
Option 1	$346/mg	$380/mg
Option 2	$356/mg	$582/mg

Table IV.9 on the following page shows the annual revenues for each community under the current average cost methodology (Column 1) and under each of the two options for the marginal cost methodology (Columns 2 and 3). Columns 5 and 6 of Table IV.9 show the percentage relationships of the revenue from each community under the two marginal cost options relative to the revenue derived under the existing average cost methodology.

Advantages and Disadvantages

Advantages:

- Promotes conservation.
- Provides proper price signals to the various communities regarding the costs associated with increasing water usage (growth).
- Recognizes responsibility for the cost of new supply.

Table IV.9

MASSACHUSETTS WATER RESOURCES AUTHORITY
COMPARISON OF FISCAL YEAR 1987 WATER COST
ASSESSMENTS UNDER EXISTING AND PROPOSED METHODOLOGIES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Average	Marginal Cost Method		Inverted	Marginal Cost Method		Inverted
Community Name	Cost Method	Option 1	Option 2	Block Method	Option 1	Option 2	Block Method
	$	$	$	$	%	%	%
Arlington	588.900	610.992	620.628	601.965	103.75%	105.39%	102.22%
Belmont	333,125	358.070	370.138	328.801	107.49%	111.11%	98.70%
Boston	14,140,750	12.886.940	12,169.832	13,401,080	91.13%	86.06%	94.77%
Brookline	873.925	910.634	927,020	897,290	104.20%	106.08%	102.67%
Chelsea	476.775	526.202	550,770	546.719	110.37%	115.52%	114.67%
Everett	1.063.075	1.186.106	1.247.702	1,124.186	111.57%	117.37%	105.75%
Lexington	727.675	899.714	988.562	762.065	123.64%	135.85%	104.73%
Lynnfield Water Dist	44.850	45,468	45.636	43.695	101.38%	101.75%	97.42%
Malden	619.450	535.596	488.804	589.430	86.46%	78.91%	95.15%
Marblehead	240.500	230.960	225.028	232.684	96.03%	93.57%	96.75%
Medford	909.350	904.648	898.894	861,784	99.48%	98.85%	94.77%
Melrose	426.075	477.926	503.964	474,851	112.17%	118.28%	111.45%
Milton	336.375	347.850	352,746	332.675	103.41%	104.87%	98.90%
Nahant	53.300	55.984	57.220	56.070	105.04%	107.35%	105.20%
Newton	1,198,275	1.183.362	1,171,146	1,137,184	98.76%	97.74%	94.90%
Norwood	532.675	617.634	660.890	553.048	115.95%	124.07%	103.82%
Quincy	1,306,175	1,374.994	1,406,902	1,310,702	105.27%	107.71%	100.35%
Revere	544,700	558.616	564,064	552,335	102.55%	103.55%	101.40%
Saugus	469,625	521,630	547,594	484,363	111.07%	116.60%	103.14%
Somerville	1,230,125	1,366,230	1,434,178	1,317.236	111.06%	116.59%	107.08%
Stoneham	421,200	461,336	481,164	423,782	109.53%	114.24%	100.61%
Swampscott	232.375	240,550	244.064	238.284	103.52%	105.03%	102.54%
Waltham	1,058,525	972.262	922.618	1,003,156	91.85%	87.16%	94.77%
Watertown	406,900	318.812	270,530	385.616	78.35%	66.49%	94.77%
Winthrop	238.875	242,150	243.036	235,511	101.37%	101.74%	98.59%
Subtotal Fully Served	28,473,575	27,834.666	27,393.130	27,894,512	97.76%	96.21%	97.97%
Cambridge	62,725	108.578	132.728	87.036	173.10%	211.60%	138.76%
Canton	270.075	388.606	450,648	373.262	143.89%	166.86%	138.21%
Lynn	267.800	385.044	446.410	327,237	143.78%	166.70%	122.19%
Needham	63.700	51,856	45,332	60,368	81.41%	71.16%	94.77%
Peabody	113,750	151,880	171,742	107.800	133.52%	150.98%	94.77%
Wakefield	280,475	320,258	340,402	301,931	114.18%	121.37%	107.65%
Wellesley	0	0	0	0			
Weston	145.275	156.562	162.042	153,755	107.77%	111.54%	105.84%
Winchester	284,700	366.556	409.050	389.504	128.75%	143.68%	136.81%
Woburn	387.725	663.578	808.828	664.996	171.15%	208.61%	171.51%
Subtotal Partial	1,876,225	2,592,918	2,967,182	2.465,889	138.20%	158.15%	131.43%
Total All Above	30,349.800	30,427.584	30,360.312	30,360,401	100.26%	100.03%	100.03%

Disadvantages:

- Potentially difficult concept and methodology for communities to understand.
- Considerably more difficult to administer than current methodology.
- Loses impact if communities do not incorporate the marginal cost concept in their own internal rate structures.
- Computation of normalized annual units of service is a relatively complex procedure.
- Revenues from communities could be somewhat erratic from year to year.
- Revenue stream to MWRA could become somewhat unstable.
- Addition of new sources of supply in the future could cause the need for a layered approach to computing marginal cost (what is "new" water to today's customers may become "old" water to customers added somewhere down the line in the future).
- Accounting for the "layered approach" described above could become cumbersome.

ALTERNATIVE W-3 - INVERTED BLOCK

Under Alternative W-3, water service is charged for using the "inverted block" methodology. Under this methodology, water is charged at an increasing unit cost as water usage increases. The rate blocks are essentially individualized for each community, based upon the community's base year usage. The base year usage is the same as that previously discussed under the marginal cost alternative, that is, the adjusted average annual consumption for the period of 1976 through 1985.

Under the inverted block charging method, there are an infinite number of blocks which could be chosen which would permit the total annual revenue requirement of the water system to be recovered. The alternative selected for presentation in this report was chosen such that: (1) annual stability of revenue would be enhanced; (2) the rate would be relatively easy to implement and understand (limitation of number of rate blocks to three); (3) conservation of water would be encouraged; (4) customers whose actual usage is approximately equal to base year usage would essentially pay for water at the average cost; and (5) customers whose usage significantly exceeds their base year usage would pay for such excess usage at the full marginal cost.

With the above criteria in mind, the rate blocks selected for this alternative are as follows: first block (0-90% of base year usage); second block (90-110% of base year usage); and third block (greater than 110% of base year usage). The unit cost for the third block was established at $705/mg. This unit cost includes the full marginal cost for the Sudbury Treatment Plant ($519/mg), as previously described, plus the current (fiscal year 1987) average cost of all non-supply related costs ($325/mg - $139/mg). The unit cost for the second block was established at the midpoint between the first and third block

rates. Given the metered units of service for the communities for calendar year 1985, and the application of the above percentages to each community's base year usage, the resulting first block rate amounts to $308/mg and the second block rate amounts to $506.50/mg.

Columns 6, 7, and 8 of Table IV.8 show the billing units under the inverted block rate methodology based upon the base year usage, calendar year 1985 usage, and rate blocks selected for this alternative. As shown at the bottom of Column 6 of Table IV.8, 86,939 mg, or about 93% of the actual calendar year units would fall in the first rate block (90% of base year use). The rate of $308/mg for this rate block is about a 5% reduction from the average cost of $325/mg. This should serve as an incentive for the communities to conserve their water usage. The second rate block (90% to 110% of base year use) contains 4,839 mg, or about 5% of the annual usage for calendar year 1985. The last rate block contains the balance of 1,606 mg, or about 2% of annual usage for 1985. It is noted that if a community were to have actual usage equal to its base year usage, the average cost of water under this proposed methodology would amount to $328/mg (90% x $308/mg + 10% x $506.50/mg), which is only slightly above the average cost of $325/mg.

Column 4 of Table IV.9 shows the revenue from each community under the inverted block methodology. Column 7 of the table shows the percentage relationship of the revenue under this methodology to the revenue under the existing average cost method.

Advantages and Disadvantages

Advantages:

- Promotes conservation.
- Provides price signals to the various communities regarding the costs associated with increasing water usage (growth).
- Recognizes responsibility for the cost of new supply.
- As a conservation oriented rate form, would be easier to implement and administer than the marginal cost rate (need to compute a normalized annual usage would be eliminated).

Disadvantages:

- Potentially difficult concept and methodology for communities to understand.
- Considerably more difficult to administer than current methodology.
- Loses impact if communities do not incorporate the marginal cost concept in their own internal rate structures.
- Revenues from communities could be somewhat erratic from year to year.
- Revenue stream to MWRA could become somewhat unstable.

- Addition of new sources of supply throughout the future could cause the need for a layered approach to computing marginal cost (what is "new" water to today's customers may become "old" water to customers added somewhere down the line in the future).

- Accounting for the "layered approach" described above could become cumbersome.

V. POLICY ISSUES AND SELECTION RATIONALE

The MWRA Board of Directors evaluated the alternative wholesale rate methodologies described in Chapter IV and selected the current wholesale water and sewer rate methodologies for FY 1988 implementation. A number of relevant policy issues, dealing with a variety of related concerns including community water conservation, stability of MWRA charges from year to year, and ease of methodology implementation and supportability, were considered by the Board.

This chapter presents the relevant policy issues considered and the Board's rationale for retaining the current water and sewer wholesale rate methodologies.

WATER POLICY ISSUES

In order to provide for future growth in water consumption within its service area, the MWRA has been investigating, evaluating and planning for the development of new sources of supply to augment the existing supply. Included among the supply alternatives are the near term prospects of Sudbury Treatment Plant (17 mgd) and the Demand Management Program, including Domestic Retrofit (16.5 mgd) and Leak Detection and Repair (7.9 mgd). Longer range projects for the development of an additional 120 mgd of supply by the year 2020 are currently under study.

The need for additional supply and the attendant costs, which are significantly greater on a per unit of capacity basis than is the existing supply cost, lead to certain water policy issues which confronted the MWRA Board. The more significant issues related to wholesale water rate methodologies are addressed below.

1. To what extent does the Board desire to send a pricing signal to member communities to encourage conservation?

   The Board considered alternatives to the current wholesale water rate methodology. The current methodology (average cost) does not specifically encourage conservation through the pricing structure. Each unit of water costs the same as any other, no matter how many units are used. The marginal cost and inverted rate alternative methodologies do tend to send a message to member communities that the use of additional water will cost more than the base use. While each alternative methodology addresses the pricing issue differently, each of the alternative methodologies sends the message that additional water usage will mean proportionately additional water costs.

2. To what extent does the Board desire that the water rate methodology be supportable from an economic pricing viewpoint?

   Supportability is an important consideration during periods of rapidly increasing cost and rate form changes. The existing average cost methodology is supportable particularly from a layman's viewpoint in that it apportions annual costs among the member communities utilizing actual metered volume and costs in the calculations. The marginal cost rate methodology is equally supportable in that the normalized use, base year use, actual use and marginal cost based rates can be calculated with a

degree of certainty. The inverted rate methodology is relatively less supportable compared with the marginal and average pricing methodologies. While the highest block rate is calculated using a marginal cost based methodology, the interim blocks and associated costs are generally arbitrarily set.

3. To what extent does the Board desire a water rate methodology that normalizes consumption fluctuations from year to year?

   Annual consumption fluctuations and related Authority charges or credits are also important considerations. Authority charges are currently directly proportional to community consumption. To the extent a community's consumption fluctuates substantially, their charge from the Authority will also fluctuate. The issue here is the extent to which a community should be charged for additional consumption (or credited for less consumption) for factors over which the community has little control such as those related to weather, local economic growth or decline or other factors. The marginal cost methodology including the regression (normalization) analysis tends to stabilize these fluctuations more than do the average cost and inverted rate methodologies.

4. To what extent does the Board desire to implement a water rate methodology that is easily supportable, understandable, and implementable?

   Regression analysis is not a part of everyday life. While the regression analysis technique tends to normalize consumption patterns and revenue streams, it is difficult to explain and more difficult to understand. The average cost and inverted rate methodologies are easier to explain, easier for member communities to understand and seemingly easier for the Authority to implement and administer. However in the allocation of approximately $30 million in annual MWRA revenue requirements, simplicity should not be the overriding objective.

5. To what extent is the Board concerned about distinguishing additional consumption from growth verses additional consumption from existing customers? Can this distinction be made? Is it the Authority's role to influence community policy with respect to this delineation?

   One train of thought might be that growth, whether due to increases in number of customers, increases in use per customer, or both, creates the need to develop additional, more costly (per unit of capacity or yield) supply. Such growth should be allocated the cost of the more costly supply through appropriately designed rates (price signals). An alternative to this would be to allocate growth costs (send appropriate price signals) to only those communities that have evidenced increases in use per customer (that is increased usage due to growth in number of customers would not be subject to increased water charges). This latter approach tends to give the message that growth (due to more customers) is in itself not a bad thing although such growth may, in fact, be responsible for the necessity of adding more supply. This approach would not "penalize" a community whose customers simply moved in from another community served by MWRA.

Measuring growth vs. increases in use per customer creates some problems in itself. What is the measure of growth, i.e., population or total number of connections? Population measures are only taken at intervals. Thus, what do you do in the interim to measure use per capita. Use per connection may be a better measure of whether a community is subject to "surcharge" for growth; however it too, has shortcomings.

6. To what extent can wholesale rate methodologies influence changes in retail rate methodologies? To what extent does the Board desire to influence retail rate methodologies?

   Increased wholesale costs of water (and sewer) services to communities do not necessarily translate into the desired MWRA results of reduced consumption by individual customers. In actuality, water conservation objectives may not be fully attainable without implementation by communities of retail rate methodologies which encourage conservation.

   Accordingly, an essential practical (and legal) issue for the Board is the extent to which MWRA should or should not influence communities to institute conservation - encouraging retail rate methodologies. Changes to wholesale water and/or sewer rate methodologies alone may or may not influence retail rate methodology changes. Ultimately, interpretation of MWRA's enabling act with regard to influencing local rate structures must be balanced with each community's autonomy to set local rate policies.

SEWER POLICY ISSUES

The immediacy of concerns relating to enhancing MWRA capabilities to control sewage discharges from member communities, along with the varied technical approaches to assign cost responsibilities for sewage services, gave rise to certain sewer policy issues. The more significant of these issues considered by the Board are discussed below.

1. To what degree does the Board desire to determine cost responsibility in proportion to community sewage discharges?

   The existing population method generally assigns cost responsibility in proportion to population. The method inherently assumes that each person in each community discharges the same amount of sewage to the system. Individual customer metered water usage data, historically collected by MWRA, indicates that sanitary discharges do, in fact, vary among communities. The unit cost method recognizes this variation in sanitary (point source) discharges, while the population method does not.

2. Non-point source sewage discharges from member communities account for more than 50 percent of the flow reaching treatment plants. Should non-point discharges (and related costs) be assigned in proportion to population or based on other measures such as number of customer connections and sanitary sewage volumes?

   Non-point source sewage is storm water, infiltration, and inflow and is not readily measurable. Population, as a measure for assigning non-point source sewage generally does not recognize the factors which contribute to the quantity of non-point sewage. Non-point sewage results from the size

and length of sewers, local construction and maintenance practices, etc. Generally, a greater number of connections to the sewer system results in the necessity to have proportionately more miles of sewers to connect them. Also, as the amount of sanitary sewage discharged increases, the larger the collecting sewers must be sized. The unit cost method uses the federally approved measures of connections and sanitary volume to recognize non-point responsibility, which from an engineering standpoint are believed to provide a better estimating mechanism than population.

3. The MWRA currently operates 3 CSO facilities and may add others in the future. To what extent does the Board desire to assign cost responsibility for such facilities to communities?

The existing population method (Alternative S-1) assigns these storm facility costs to all communities in proportion to population. The unit cost method without the CSO option (Alternative S-2) assigns these costs to all communities in proportion to estimated total sanitary and non-point source sewage discharges. The unit cost method with CSO option (Alternative S-3) separately identifies storm facility costs and assigns such costs generally in proportion to the sewered acreage in each community. Combined sewer areas receive a higher proportion of CSO costs recognizing greater storm water sewage discharges from combined sewers.

4. To what extent does the Board desire to implement a sewer rate methodology that is easily supportable, understandable and implementable?

Supportability and understandability are important to any rate method when costs of service become significant. While the population method has long been employed by the MWRA (and its predecessor) it is not well understood by the public nor does it provide a price signal. The unit cost approach develops a unit cost (e.g., $/million gallons) which provides a price signal and a measure which might be employed by communities at the retail level for local rate design. The unit cost method could be implemented by MWRA with some modification. It is also readily adaptable and could utilize metered sewage data if available in the future. The population method is not commonly used in this country for sewage cost determination. The unit cost approach is widely used throughout the country and recommended by leading professional organizations.

5. To what extent does the Board desire methodologies which provide relatively stable charges from year to year?

An important wholesale consideration relates to the lack of variability of assessments from year to year. Methodologies which produce assessments of limited variation, and therefore more predictability, may be desirable from the perspective of local community officials. Increased predictability of assessments facilitates local community financial planning. In general, the current population and population equivalent sewer methodology provides greater relative stability of assessments from year to year than the alternative methodologies.

6. To what extent will changes in sewer rate methodologies cause significant reallocations of cost responsibilities among member communities?

Due to the different methods of estimating sewer use in each of the alternative methodologies, significant reallocations of costs can occur with a shift to a new sewer rate methodology. Given that any methodology relies upon estimates of sewer use - according to different measurement factors - are such reallocations of costs warranted pending the installation of sewage meters within the next several years? Should the Authority make interim changes to rate methodologies simply to change the basis of estimation?

SELECTION RATIONALE

Upon consideration of the alternative water and sewer rate methodologies, the FY 1987 impact of each alternative on member community charges, and the policy issues previously described, the Board voted to retain the current water and sewer wholesale methodologies for use in FY 1988. The rationale for the Board's decision is outlined as follows:

Water

While the current unit cost methodology does not differentiate between "base" water consumption and costs and the marginal cost of "new" water, it does result in an understandable and equitable pricing structure for all users. Also, under the present method, consumption levels and charges are directly related, notwithstanding the time lag in this relationship.

In addition to these factors of simplicity and equity, however, the Board agreed with the Advisory Board's position that retail rate structures, more than wholesale rates, provide the most direct financial incentives for water conservation, and thus are more effective in advancing the Authority's objectives in this area. The Board, in voting to retain current wholesale rate methodologies, endorsed this position, and requested its staff to develop programs by which the Authority could assist local communities in this effort. These assistance programs are currently being reviewed, and will be presented in the Management Plan for Board action, along with their costs and other resource requirements.

Sewer

With respect to sewer rate methodologies, the Board considered the advantages and limitations of all the alternatives developed for review, and their dollar impacts upon member communities. Notwithstanding the advantages that might be gained with respect to several rate-making criteria, (more economic pricing, more understandable methodologies, etc.), the Board was reluctant to change the current sewer charge estimation methods for alternative methods which also utilize estimates of member usage (and cost shares). The Board seeks to measure actual use through flow meters as the most accurate - and equitable - basis for allocating costs. Until the Authority can meter its sewerage system, any interim wholesale methodological change may unfairly burden some communities.

VI. ESTIMATED IMPACT OF SELECTED METHODOLOGIES

This chapter presents the estimated impacts of selected water and sewer rate methodologies as called for in Section 8(e) of the Authority's enabling legislation.

The Authority's wholesale water and sewer rates and rate methodologies have had and will continue to have an important impact upon its communities and the Commonwealth at large. The costs of sewage treatment and water supply protection and distribution will be borne entirely by system users. The changed cost incidence represents an important shift in financing responsibility from the general public (through tax subsidies and community assessments) to specific beneficiaries. While each member community may legally continue to finance its share of system costs either wholly or partially from general tax funds, the magnitude of necessary cost increases, combined with statutory limits on local tax levies, effectively requires a "pass through" of such costs to actual users through user fees, in order to avoid reductions in other municipal services. This impact on local finances is readily apparent in the number of member communities that have recently raised, or imposed for the first time, local water and sewer rates.

The **economic and fiscal impacts** of Authority charges on member communities can be quantified in several ways, although unique local fiscal circumstances make any absolute measures of impact difficult to develop. The sheer magnitude of increased Authority charges to its communities, regardless of the allocation methodology selected, is certainly an important new factor in local budget and financing decisions. In the current fiscal year, combined water and sewer charges to communities total nearly $91 million, an increase of $32 million over FY 1986 Authority charges. In some communities, Authority charges have more than doubled in the first full year of Authority operations, while average combined charges to all communities increased by approximately 54% between FY 1986 and FY 1987.

These increased Authority charges make up only part of total local water and sewer costs, since the operation and maintenance of local transmission and distribution systems are also the responsibility of local government. These costs have also continued to rise, although not to the extent of Authority charges. It may be reasonably anticipated however, that the costs of local system improvements and extensions will henceforth compete with Authority charges in local budget decisions, as increased local user charges (or property tax levies) are subject to more citizen and political resistance.

In conjunction with the impact on local water and sewer costs and revenue requirements, Authority charges should also be viewed from the perspective of total municipal services and financing means. As an essential public utility, water and sewer service levels are not discretionary within each community. Then they cannot be significantly altered based on a community's economic position. Thus, the community's ability to finance these services, in whatever manner it chooses, is not a factor in the determination of these "community costs". Notwithstanding this important factor, each community's underlying fiscal strength (or weakness) should be considered in assessing the impact of these costs on the municipality's economy and its citizens. To this end, data from the Massachusetts Special Commission on Tax Reform has been

utilized which reflects the "fiscal position" of member communities, as compared to all cities and towns throughout the Commonwealth. These data, which measure each community's property wealth and income per resident, provide a useful indicator of the relative fiscal strength of Authority member communities as compared to all other Massachusetts communities. As the data shows, approximately 21 Authority communities fall below the statewide median ranking in fiscal strength, while six communities rank in the bottom 20%.

The **social impacts** of the Authority's charges are more difficult to assess at the present time, given the limitations of data at the community level, and the difficulty of correlating retail pricing and economic decisions with wholesale rates and rate methodologies. Notwithstanding these difficulties, the study attempts to evaluate the social impact of Authority rates through the use of demographic data for each community, so as to develop rough comparisons of residential "ability to pay" (median household income) with average household charges for MWRA water and sewer charges. These comparisons, while imprecise, do reflect the relatively higher share of household income paid as user fees in the less affluent communities (with lower median incomes) to finance that community's average household charge from the MWRA. While actual household costs for water and sewer service may be significantly different in each community than the average charges shown (due to local rates, consumption differences, etc.), the general relationships between average household costs and ability to pay are valid, and reflect the growing economic burden of MWRA charges on household income. To the extent that future increases in Authority charges intensify this burden, local governments (or the Commonwealth) may need to mitigate the impact of such increases through relief programs or other forms of income-based subsidies in selected communities.

More than any other, the **environmental impacts** of Authority charges defy simple quantification and description. While the benefits to the region and the Commonwealth from enhanced sewage treatment capabilities are generally well known, the secondary effects attributable to the increased costs of water and sewer services within member communities are less clear. At a minimum, increased retail charges will provide a stronger incentive to conserve water on the part of individual users, thereby reducing overall demand on both water supply and sewage treatment. In addition, the Board's decision to undertake a sewage metering program as the basis for future sewer assessments can be expected to provide stronger incentives to municipalities to minimize infiltration and inflow into local collection systems. These and other fiscal incentives to "tighten up" local water and sewer systems may all be viewed as important components of a more comprehensive water management system which recognizes the true cost and value of water to the region's economic and environmental well being.

The following sections present in more detail the economic/fiscal, social, and environmental impacts of the Authority's charges on member communities and the region as a whole, to the extent that current data facilitate such analysis.

IMPACT ANALYSIS

Economic and Fiscal Impact

The scope of the Authority's water and sewer services reflects the major role that it plays in the economic well-being of the Commonwealth. In total, over 2.2 million people are provided water and sewer services daily by the Authority, representing approximately 38% of the total population of the Commonwealth. Within this large and diverse group of users, a wide variety of economic and fiscal conditions exist in the Authority's 51 communities. In the data base developed for this study, selected indicators of each community's fiscal position have been included (tax levy, assessed valuation, median household income, median value of occupied household, etc.).

The overall fiscal impact of Authority charges on member communities can best be reflected in the significant increases in local financing responsibilities that have occurred since the Authority's inception. These increases, which have resulted from increased Authority costs passed on in their entirety to local governments, represent the major fiscal impact of Authority charges at the local level, and would not be affected by the reallocation of such costs among member communities due to new rate methodologies.

It should also be noted that this study deals with the present impact of the Authority's rates. It does not consider future events which may substantially increase the Authority's costs, its resulting revenue requirements, and the higher rate levels which would be required. Such events may result from changes in demand, court-ordered activities or Authority initiated programs.

Table VI.1 on the following page shows each community's combined (water and sewer) Authority charges for FY 1986 and FY 1987, and the absolute and percentage increase for each. As can be seen, total local financing responsibility increased by approximately $32 million in a single year, resulting in an average community increase to each member community of approximately 54%. The impact of these increases on individual communities differs greatly, according to local water/sewer costs and revenues, and financing methods. Table VI.2 shows the percentage of FY 1985 actual local water and sewer costs and revenues which the FY 1987 Authority charges constitute. Although data is not now available which would allow same-year comparisons, Table VI.2 indicates that Authority charges are a major portion of local costs and consume a large percentage of water sewer revenues, based upon the most recent actual community data (FY 1985). While local rate increases have reduced this ratio in some communities, Authority charges can be expected to remain a very high percentage of local costs and revenues for water and sewer service.

In order to assess the fiscal impact of Authority charges on each community, FY 1986 and FY 1987 charges were compared to "local" water and sewer costs and revenues in each community for FY 1985 (the most recent fiscal year for which actual community expenditures were available). These comparisons (stated as percentages) may be roughly taken as the extent to which Authority charges have "burdened" local costs and revenues for the first two fiscal years of its existence. In addition, the extent to which localities presently recover water and sewer costs from user fees, or require tax subsidies, is also included in the impact summary, as indicative of local financing methods.

Table VI.1

COMMUNITY FISCAL IMPACT

	FY 1986 MWRA Charge	FY 1987 MWRA Charge (Current Method)	MWRA Charge Increase ($)	MWRA Charge Increase (%)
ARLINGTON	$1,269,532	$1,970,832	$701,300	55.24%
ASHLAND	$79,588	$216,077	$136,489	171.49%
BEDFORD	$200,669	$375,367	$174,698	87.06%
BELMONT	$702,779	$1,084,933	$382,154	54.38%
BOSTON	$21,650,512	$32,242,915	$10,592,403	48.92%
BRAINTREE	$607,199	$1,068,290	$461,091	75.94%
BROOKLINE	$1,582,440	$2,465,145	$882,705	55.78%
BURLINGTON	$366,840	$687,781	$320,941	87.49%
CAMBRIDGE	$1,954,601	$3,342,806	$1,388,205	71.02%
CANTON	$422,350	$715,262	$292,912	69.35%
CHELSEA	$769,041	$1,225,818	$456,777	59.40%
DEDHAM	$367,610	$657,110	$289,500	78.75%
EVERETT	$1,480,200	$2,252,744	$772,544	52.19%
FRAMINGHAM	$965,444	$1,735,358	$769,914	79.75%
HINGHAM	$92,330	$166,474	$74,144	80.30%
HOLBROOK	$56,493	$121,894	$65,401	115.77%
LEXINGTON	$1,093,871	$1,537,016	$443,145	40.51%
LYNN	$212,503	$267,618	$55,115	25.94%
LYNNFIELD	$37,928	$44,738	$6,810	17.96%
MALDEN	$1,427,404	$2,195,416	$768,012	53.80%
MARBLEHEAD	$196,902	$240,421	$43,519	22.10%
MEDFORD	$1,791,332	$2,619,786	$828,454	46.25%
MELROSE	$837,290	$1,295,919	$458,629	54.78%
MILTON	$696,839	$1,069,844	$373,005	53.53%
NAHANT	$40,349	$53,278	$12,929	32.04%
NATICK	$401,580	$754,010	$352,430	87.76%
NEEDHAM	$532,813	$823,951	$291,138	54.64%
NEWTON	$2,444,116	$3,664,422	$1,220,306	49.93%
NORWOOD	$1,074,349	$1,515,823	$441,474	41.09%
PEABODY	$80,429	$113,915	$33,486	41.63%
QUINCY	$2,486,010	$3,802,671	$1,316,661	52.96%
RANDOLPH	$374,032	$684,427	$310,395	82.99%
READING	$315,664	$567,147	$251,483	79.67%
REVERE	$1,101,336	$1,732,744	$631,408	57.33%
SAUGUS	$384,120	$469,575	$85,455	22.25%
SOMERVILLE	$2,254,507	$3,494,014	$1,239,507	54.98%
STONEHAM	$664,456	$1,039,613	$375,157	56.46%
STOUGHTON	$254,119	$484,706	$230,587	90.74%
SWAMPSCOTT	$192,329	$232,487	$40,158	20.88%
WAKEFIELD	$657,861	$999,281	$341,420	51.90%
WALPOLE	$233,781	$419,946	$186,165	79.63%
WALTHAM	$2,052,493	$2,992,073	$939,580	45.78%
WATERTOWN	$933,246	$1,426,097	$492,851	52.81%
WELLESLEY	$402,904	$715,909	$313,005	77.69%
WESTON	$118,356	$145,218	$26,862	22.70%
WESTWOOD	$128,867	$234,631	$105,764	82.07%
WEYMOUTH	$702,050	$1,276,685	$574,635	81.85%
WILMINGTON	$178,918	$255,872	$76,954	43.01%
WINCHESTER	$458,721	$844,399	$385,678	84.08%
WINTHROP	$516,309	$799,920	$283,611	54.93%
WOBURN	$923,549	$1,583,424	$659,875	71.45%
TOTALS	$58,768,961	$90,725,802	$31,956,841	54.38%

Table VI.2

MWRA COMBINED CHARGES * COMPARED TO LOCAL WATER/SEWER COSTS AND REVENUES

	FY 1987 MWRA CHARGES AS % OF FY85 COMBINED W/S COSTS	FY 1987 MWRA CHARGES AS % OF FY85 COMBINED W/S REVENUES
ARLINGTON	87.09%	95.73%
BELMONT	90.97%	90.99%
BOSTON	46.97%	59.27%
BROOKLINE	64.48%	65.41%
CAMBRIDGE	99.56%	88.40%
CANTON	62.76%	39.82%
CHELSEA	92.09%	119.84%
EVERETT	120.63%	155.45%
LEXINGTON	63.68%	81.79%
MEDFORD	138.45%	97.60%
MELROSE	99.10%	142.50%
MILTON	126.22%	77.55%
NEEDHAM	55.48%	74.50%
NEWTON	75.85%	75.99%
NORWOOD	104.51%	105.96%
QUINCY	69.53%	101.35%
REVERE	59.66%	157.52%
SOMERVILLE	100.70%	69.41%
STONEHAM	66.57%	78.47%
WAKEFIELD	75.93%	86.01%
WALTHAM	62.53%	61.30%
WATERTOWN	78.67%	**
WINCHESTER	53.02%	67.27%
WINTHROP	53.13%	79.74%
WOBURN	76.26%	89.26%

* Charges are shown for member communities which receive both water and sewer service from the MWRA

** Revenue data not yet available

Environmental Impact

The impact of Authority charges on local and regional environmental factors must be viewed primarily from the perspective of anticipated benefits occurring from Authority activities. These activities will have long-term effects on the quality of Boston Harbor, and the many commercial and recreational uses which it supports. In brief, the upgrading of the primary treatment plants and the construction of new secondary treatment and combined sewer overflow (CSO) facilities will benefit households who recreate in, on or near the water, consumers of commercial fisheries, consumers who benefit from increased economic activity, and non-users of Harbor waters, who derive intrinsic benefits.

Based upon previous environmental impact studies, increased recreational opportunities and diminished exposure to health risks are deemed to be the major "consumer" benefits of improved water quality in Boston Harbor. Recreational benefits accrue to swimmers, boaters, fishers and those who recreate near the water, while health benefits from water pollution abatement include prevention of swimming - related illnesses and shellfish consumption - related illnesses. Water pollution abatement is also predicted to have an important effect on benefits which are not specifically related to actual water use, such as option, existence, and aesthetic values, as well as ecological processes in saltmarsh areas throughout the harbor.

In addition to these direct results of Authority activities financed partially by Authority charges, other environmental benefits may be reasonably expected to occur as a result of increased local concern over water and sewer systems due to higher costs. Increased leak detection and repair of water lines will not only reduce local water use and costs, but also extend the Authority's own water supply capacity. Reduced infiltration and inflow into local sewer lines will reduce system backups, and help mitigate local as well as regional overflow problems. In brief, higher water and sewer costs will provide stronger financial incentives to correct long-standing deficiencies in local systems and to improve overall water management practices.

Social Impact

The social impacts of Authority charges on member communities have been estimated using demographic data to develop rough approximations of each community's average household charges from the Authority as compared to median household income.

While Authority charges do not necessarily reflect the full burden of local water and sewer costs in each community, and may in fact be less than or greater than those costs which are passed on to users through retail rates, they can be taken as reflecting the relative economic burden imposed on the average household in each community, irrespective of whether these charges are paid entirely through user charges, or partially "subsidized" through local tax levies. To the extent that general tax funds are used to finance Authority charges in a community, the actual household "burden" of such charges are further redistributed, according to that community's property tax base and tax levy.

The absence of detailed local records which distinguish types of property among water and sewer users (residential, industrial, commercial, etc.) precludes the computation of actual household charges in each community. Accordingly, average household (and other "small user") charges were developed using a two-step process as shown on Table VI.3 on the next page. First, total combined Authority water and sewer charges for each community were multiplied by the percentage of users classified as non-industrial (less than 25,000 gallons per day), according to information collected through the annual survey of sewer users. The resulting amount is taken to be the approximate portion of Authority charges attributable to residential and other small users. These total community charges were then divided by the number of households per community (per 1980 Federal Census). These calculations yield the "FY 1987 combined charges per household" figures for each community.

The impact of these average combined charges on each community's households was then assessed according to the median household income levels (based on the 1980 Federal Census) in each of the Authority's member communities. The ratio of combined charges per household as a percent of median household income is taken to be an approximation of the relative burden of Authority charges on the average household in each community, based upon the average household's "ability to pay".

As can be seen, the relative impact of Authority charges on member community households is strongly correlated with median household income, ranging from approximately one per cent in communities with the lowest median household income (Chelsea and Boston), to less than one-half of one per cent in those fully-served communities with the highest median income levels (Lexington, Belmont and Newton). Future increases in Authority charges can be expected to widen these differences in relative household burdens, as Authority charges will likely increase at a faster rate than income levels.

Table VI.3

ESTIMATED IMPACT OF MWRA CHARGES ON HOUSEHOLDS AND SMALL USERS *

COMMUNITIES	FY 1987 COMBINED MWRA CHARGES	% OF MWRA SEWER SERVICE FOR RESIDENTIAL & SMALL USERS	MWRA COMBINED CHARGES FOR RESIDENTIAL & SMALL USERS	1980 NUMBER OF HOUSEHOLDS	FY 1987 MWRA CHARGES PER HOUSEHOLD AND SMALL USERS **	1980 MEDIAN HOUSEHOLD INCOME	MWRA CHARGES AS % OF MEDIAN HOUSEHOLD INCOME **
Chelsea	$1,225,676	97.30%	$1,192,583	10,470	$113.90	$11,134	1.02%
Boston	$32,242,637	90.70%	$29,244,072	241,444	$121.12	$12,390	0.98%
Everett	$2,252,562	91.90%	$2,070,104	14,665	$141.16	$15,586	0.91%
Somerville	$3,493,774	97.00%	$3,388,961	30,942	$109.53	$14,415	0.76%
Medford	$2,619,562	97.80%	$2,561,932	20,647	$124.08	$18,474	0.67%
Revere	$1,732,696	100.00%	$1,732,696	17,176	$100.88	$15,265	0.66%
Waltham	$2,991,978	86.90%	$2,600,029	21,224	$122.50	$18,700	0.66%
Stoneham	$1,039,659	99.00%	$1,029,262	7,652	$134.51	$21,350	0.63%
Malden	$2,195,333	98.00%	$2,151,426	21,464	$100.23	$15,941	0.63%
Quincy	$3,802,794	97.20%	$3,696,316	34,352	$107.60	$17,230	0.62%
Winthrop	$799,966	98.20%	$785,567	7,641	$102.81	$18,281	0.56%
Norwood	$1,515,748	84.50%	$1,280,807	10,604	$120.79	$21,527	0.56%
Melrose	$1,295,876	99.20%	$1,285,509	10,973	$117.15	$21,141	0.55%
Wakefield x	$999,345	99.30%	$992,350	8,817	$112.55	$21,107	0.53%
Watertown	$1,426,219	96.80%	$1,380,580	13,582	$101.65	$19,260	0.53%
Brookline	$2,465,043	99.20%	$2,445,323	24,379	$100.30	$19,546	0.51%
Arlington	$1,971,030	99.70%	$1,965,117	18,880	$104.08	$20,520	0.51%
Milton	$1,069,876	97.30%	$1,040,989	8,555	$121.68	$24,376	0.50%
Cambridge x y	$3,342,643	82.70%	$2,764,366	41,300	$66.93	$14,013	0.48%
Lexington	$1,537,143	93.30%	$1,434,154	9,781	$146.63	$31,629	0.46%
Belmont	$1,084,798	98.00%	$1,063,102	9,895	$107.44	$23,432	0.46%
Newton	$3,664,401	95.10%	$3,484,845	29,131	$119.63	$26,479	0.45%
Canton x	$715,338	87.30%	$624,490	5,798	$107.71	$25,431	0.42%
Woburn x	$1,583,536	68.90%	$1,091,056	12,723	$85.75	$20,601	0.42%
Winchester x	$844,228	98.70%	$833,253	6,928	$120.27	$29,092	0.41%
Needham x	$823,780	94.80%	$780,943	9,489	$82.30	$29,156	0.28%

* SMALL USERS DEFINED AS HAVING CONSUMPTION UNDER 25,000 GALLONS/DAY

** SINCE THE 1980 NUMBER OF HOUSEHOLDS USED TO COMPUTE THESE FIGURES DOES NOT INCLUDE THE NUMBER OF SMALL USERS WHO ARE INCLUDED IN THE MWRA CHARGE COMPUTATION, THESE FIGURES MAY OVERSTATE THE IMPACT OF MWRA CHARGES ON THESE USER GROUPS

x = COMMUNITIES WITH PARTIAL MWRA WATER SERVICES

y = USE A SMALL AMOUNT OF MWRA WATER FOR EMERGENCY PURPOSES ONLY

VII. MWRA MANAGEMENT PLAN

The MWRA Management Plan, to be completed as the last major task in this study, will incorporate Board water and sewer policy decisions into a set of management guidelines for MWRA. Specifically, this plan will reflect the Board of Directors' election to retain the current water and sewer wholesale rate methodologies for FY 1988 and its directive to further examine how water conservation may be encouraged through appropriate retail rate structures.

The Management Plan will also present MWRA management guidelines with respect to maintaining and expanding the community data base, administering public information and communications programs relating to rates, water conservation, and other related items.

In general, the Management Plan will translate Board policy decisions and directives and Authority objectives into a practical plan for attainment.

Attachment A

COMMUNITY DATA BASE

	RECEIVE MWRA SEWER SERVICES (Y=YES;N=NO)	RECEIVE MWRA WATER SERVICES (Y=YES;P=PARTIAL; N=NO)	1970 POPULATION	1980 POPULATION	1985 POPULATION	POPULATION CHANGE 1970 TO 80	POPULATION CHANGE 1980 TO 85	SQUARE MILES	1980 POPULATION PER SQUARE MILE	1980 PERSONS PER HOUSEHOLD	1980 AGE DIST UNDER 5 YEARS
TOWN	1000	1005	1100	1105	1110	1115	1120	1125	1130	1135	1140
Arlington	Y	Y	53,534	48,219	46,465	-9.93%	-3.64%	5.18	9,309	2.55	2,127
Ashland	Y	N	8,882	9,165	10,531	3.19%	14.90%	12.40	739	2.89	592
Bedford	Y	P	13,512	13,067	11,709	-3.29%	-10.39%	13.73	952	3.43	695
Belmont	Y	Y	28,285	26,100	26,170	-7.72%	0.30%	4.59	5,686	2.64	1,080
Boston	Y	Y	641,	562,994	570,719	-12.18%		43.18	13,038	2.33	29,982
Braintree	Y	N	35,000	36,337	35,189	3.82%	-3.16%	13.70	2,652	3.10	1,639
Brookline	Y	Y	58,886	55,062	58,152	-6.49%	5.61%	6.62	8,318	2.26	1,767
Burlington	Y	N	21,980	23,486	22,514	6.85%	-4.14%	11.84	1,984	3.31	1,364
Cambridge	Y	P	100,361	95,322	86,865	-5.02%	-8.87%	6.25	15,252	2.31	3,834
Canton	Y	P	17,100	18,182	17,550	6.33%	-3.48%	19.02	956	3.14	999
Chelsea	Y	Y	30,625	25,431	23,432	-16.96%	-7.86%	1.86	13,673	2.43	1,734
Dedham	Y	N	26,938	25,298	23,729	-6.09%	-6.20%	10.46	2,419	3.01	1,189
Everett	Y	Y	42,485	37,195	35,773	-12.45%	-3.82%	3.36	11,070	2.54	2,055
Framingham	Y	Y	64,048	65,113	61,241	1.66%	-5.95%	23.92	2,722	2.65	3,442
Hingham	Y	N	18,845	20,339	20,648	7.93%	1.52%	22.45	906	3.12	1,131
Holbrook	Y	N	11,775	11,140	10,901	-5.39%	-2.15%	7.30	1,526	3.17	679
Lexington	Y	Y	31,886	29,479	29,224	-7.55%	-0.87%	16.48	1,789	3.01	1,254
Lynn	N	P	90,294	78,471	78,463	-13.09%	-0.01%	10.47	7,495	2.41	5,070
Lynnfield	N	Y	10,826	11,267	11,135	4.07%	-1.17%	10.22	1,102	3.16	484
Malden	Y	Y	56,127	53,386	52,474	-4.88%	-1.71%	5.08	10,509	2.49	2,912
Marblehead	N	Y	21,295	20,126	19,403	-5.49%	-3.59%	4.40	4,574	2.42	817
Medford	Y	Y	64,397	58,076	57,184	-9.82%	-1.54%	8.21	7,074	2.81	2,746
Melrose	Y	Y	33,180	30,055	28,774	-9.42%	-4.26%	4.73	6,354	2.74	1,645
Milton	Y	Y	27,190	25,860	25,589	-4.89%	-1.05%	13.10	1,974	3.02	1,153
Nahant	N	Y	4,119	3,947	4,070	-4.18%	3.12%	1.04	3,795	2.55	187
Natick	Y	N	31,057	29,461	30,280	-5.14%	2.78%	14.89	1,979	2.82	1,575
Needham	Y	P	29,748	27,901	27,870	-6.21%	-0.11%	12.50	2,232	2.94	1,427
Newton	Y	Y	91,066	83,622	82,925	-8.17%	-0.83%	17.90	4,672	2.87	3,706
Norwood	Y	Y	30,815	29,711	28,551	-3.58%	-3.90%	10.47	2,838	2.80	1,421
Peabody	N	P	48,080	45,976	45,766	-4.38%	-0.46%	16.45	2,795	2.83	2,485
Quincy	Y	Y	87,966	84,743	88,122	-3.66%	3.99%	16.51	5,133	2.47	3,835
Randolph	Y	N	27,035	28,218	28,435	4.38%	0.77%	10.08	2,799	2.94	1,374
Reading	Y	N	22,539	22,678	21,993	0.62%	-3.02%	9.84	2,305	3.03	1,274
Revere	Y	Y	43,159	42,423	39,152	-1.71%	-7.71%	5.95	7,130	2.47	1,893
Saugus	N	Y	25,110	24,746	24,628	-1.45%	-0.48%	10.58	2,339	2.98	1,281
Somerville	Y	Y	88,779	77,372	71,134	-12.85%	-8.06%	3.93	19,688	2.50	4,008
Stoneham	Y	Y	20,725	21,424	21,836	3.37%	1.92%	6.03	3,553	2.80	1,155
Stoughton	Y	N	23,459	26,710	24,156	13.86%	-9.56%	16.26	1,643	3.01	1,659
Swampscott	N	Y	13,578	13,837	13,524	1.91%	-2.26%	3.08	4,493	2.65	603
Wakefield	Y	P	25,402	24,895	24,495	-2.00%	-1.61%	7.35	3,387	2.82	1,386
Walpole	Y	N	18,149	18,859	18,092	3.91%	-4.07%	20.57	917	3.26	1,021
Waltham	Y	Y	61,582	58,200	57,955	-5.49%	-0.42%	12.41	4,690	2.74	2,627
Watertown	Y	Y	39,307	34,384	32,189	-12.52%	-6.38%	4.06	8,469	2.53	1,536
Wellesley	Y	P	28,051	27,209	27,052	-3.00%	-0.58%	10.05	2,707	3.17	1,222
Weston	N	P	10,870	11,169	10,743	2.75%	-3.81%	17.18	650	3.36	413
Westwood	Y	N	12,750	13,212	13,174	3.62%	-0.29%	11.15	1,185	3.13	594
Weymouth	Y	N	54,610	55,601	53,735	1.81%	-3.36%	16.70	3,329	2.80	2,885
Wilmington	Y	N	17,102	17,471	17,704	2.16%	1.33%	17.08	1,023	3.42	1,143
Winchester	Y	P	22,269	20,701	20,763	-7.04%	0.30%	5.90	3,509	2.99	965
Winthrop	Y	Y	20,335	19,294	18,141	-5.12%	-5.98%	1.56	12,368	2.53	789
Woburn	Y	P	37,406	36,626	34,793	-2.09%	-5.00%	12.86	2,848	2.88	2,120
			2,443,590	2,279,560	2,245,120			570.93			114,990

	1980 AGE DIST 5 TO 17 YEARS	1980 AGE DIST 18 TO 64 YEARS	1980 AGE DIST 65 + YEARS	% POPULATION W/ 4 YR COLLEGE EDUCATION 25 AND OVER	% POPULATION W/ 4 YR COLLEGE EDUCATION 18 TO 24 YRS	NUMBER OF HOUSEHOLDS	TOTAL OCCUPIED HOUSEHOLDS	TOTAL OCCUPIED WITH PUBLIC WATER SERVICE	TOTAL OCCUPIED WITH PUBLIC SEWER AS A %	TOTAL OCCUPIED WITHOUT PUBLIC SEWER AS A %	TOTAL OCCUPIED MEDIAN VALUE
TOWN	1145	1150	1155	1160	1165	1500	1505	1510	1515	1520	1525
Arlington	9,267	28,793	8,032	29.1%	NA	18,880	18,552	18,533	99.3%	0.7%	63,500
Ashland	2,298	5,665	610	23.5%	NA	3,166	3,082	3,045	44.8%	55.2%	54,600
Bedford	3,429	7,876	1,067	37.1%	NA	3,809	3,741	3,659	56.4%	43.6%	76,600
Belmont	5,100	15,063	4,849	42.1%	NA	9,895	9,724	9,714	97.9%	2.1%	87,000
Boston	121,173	340,774	71,065	20.3%	15.0%	241,444	218,457	218,457	99.3%	0.7%	36,000
Braintree	9,334	20,599	4,765	17.8%	NA	11,716	11,484	11,461	95.9%	4.1%	49,700
Brookline	8,395	34,458	10,442	49.0%	36.0%	24,379	23,601	23,601	99.6%	0.4%	96,700
Burlington	7,118	13,930	1,074	23.7%	NA	7,011	6,905	6,857	87.7%	12.3%	61,400
Cambridge	17,153	63,411	10,924	43.1%	24.4%	41,300	38,836	38,797	99.3%	0.7%	58,400
Canton	5,116	10,179	1,888	25.3%	NA	5,798	5,638	5,593	73.5%	26.5%	62,700
Chelsea	5,737	13,731	4,229	7.2%	NA	10,470	9,715	9,696	99.1%	0.9%	35,600
Dedham	6,295	14,574	3,240	18.3%	NA	8,409	8,276	8,210	92.6%	7.4%	53,700
Everett	7,773	21,405	5,962	7.9%	NA	14,665	14,139	14,139	99.6%	0.4%	49,700
Framingham	15,072	39,340	7,259	28.7%	13.0%	24,611	23,943	23,847	96.2%	3.8%	62,400
Hingham	5,845	11,313	2,050	39.6%	NA	6,512	6,323	6,095	28.7%	71.3%	71,300
Holbrook	3,154	6,410	897	11.0%	NA	3,519	3,443	3,436	17.6%	82.4%	40,900
Lexington	7,447	17,378	3,400	47.0%	NA	9,781	9,673	9,654	87.6%	12.4%	84,600
Lynn	17,757	43,131	12,505	9.5%	7.0%	32,617	30,421	30,421	98.8%	1.2%	38,200
Lynnfield	3,155	6,588	1,040	35.0%	NA	3,570	3,525	3,423	3.8%	96.2%	80,300
Malden	11,233	30,755	8,486	11.3%	9.2%	21,464	20,746	20,725	98.9%	1.1%	46,300
Marblehead	4,289	12,240	2,780	39.8%	NA	8,305	7,915	7,907	97.3%	2.7%	80,700
Medford	13,334	33,408	8,588	13.2%	8.5%	20,647	20,206	20,186	99.7%	0.3%	52,100
Melrose	7,057	16,823	4,530	21.6%	NA	10,973	10,649	10,638	99.5%	0.5%	56,200
Milton	6,009	14,219	4,479	28.3%	NA	8,555	8,369	8,344	93.6%	6.4%	61,600
Nahant	773	2,428	559	29.5%	NA	1,547	1,433	1,433	95.3%	4.7%	66,100
Natick	7,055	17,665	3,166	29.1%	NA	10,443	10,169	10,138	80.9%	19.1%	57,900
Needham	6,806	16,063	3,605	42.8%	NA	9,489	9,359	9,350	88.4%	11.6%	78,900
Newton	18,640	49,385	11,891	45.9%	17.4%	29,131	28,464	28,464	97.2%	2.8%	81,200
Norwood	6,678	17,658	3,954	21.0%	NA	10,604	10,419	10,409	98.0%	2.0%	55,000
Peabody	11,340	27,232	4,919	15.7%	NA	16,248	15,804	15,904	84.9%	15.1%	54,400
Quincy	17,179	49,203	14,526	15.8%	10.7%	34,352	33,492	33,492	99.5%	0.5%	44,400
Randolph	6,884	16,644	3,316	14.9%	NA	9,605	9,406	9,368	82.4%	17.6%	46,200
Reading	5,938	13,161	2,245	27.9%	NA	7,486	7,308	7,257	85.5%	14.5%	63,700
Revere	8,705	25,624	6,201	7.7%	NA	17,176	16,367	16,367	99.1%	0.9%	47,200
Saugus	6,161	14,368	2,936	11.2%	NA	8,307	8,186	8,063	98.5%	1.5%	49,600
Somerville	15,769	47,096	10,499	16.4%	14.3%	30,942	29,687	29,687	100.0%	0.0%	43,200
Stoneham	5,024	12,371	2,874	18.8%	NA	7,652	7,506	7,506	100.0%	0.0%	57,300
Stoughton	6,928	15,305	2,818	14.6%	NA	8,870	8,682	8,552	54.3%	45.7%	47,700
Swampscott	3,007	7,949	2,278	33.6%	NA	5,229	5,057	5,047	97.5%	2.5%	65,000
Wakefield	5,608	14,548	3,353	20.5%	NA	8,817	8,650	8,641	94.4%	5.6%	59,000
Walpole	5,078	11,166	1,594	20.9%	NA	5,785	5,676	5,506	43.9%	56.1%	57,000
Waltham	12,711	35,695	7,167	19.1%	10.4%	21,224	20,594	20,573	97.4%	2.6%	57,300
Watertown	6,046	21,441	5,361	25.9%	NA	13,582	13,261	13,261	99.7%	0.3%	61,900
Wellesley	7,082	15,449	3,456	56.3%	NA	8,589	8,431	8,423	90.6%	9.4%	99,400
Weston	3,155	6,389	1,212	61.7%	NA	3,327	3,271	2,967	4.4%	95.6%	143,500
Westwood	3,628	7,556	1,434	37.7%	NA	4,222	4,171	4,029	47.6%	52.4%	72,300
Weymouth	13,931	32,480	6,305	14.8%	7.8%	19,890	19,429	19,390	79.2%	20.8%	44,700
Wilmington	5,372	9,828	1,128	13.3%	NA	5,109	5,004	4,804	3.2%	96.8%	53,600
Winchester	5,113	11,949	2,674	44.6%	NA	6,928	6,800	6,800	99.5%	0.5%	84,700
Winthrop	3,911	11,515	3,079	17.7%	NA	7,641	7,390	7,383	100.0%	0.0%	51,000
Woburn	8,752	21,998	3,756	15.3%	NA	12,723	12,393	12,368	93.4%	6.6%	51,500
	509,874	1,354,229	300,467			876,414	833,772	831,620			

	% OWNER OCCUPIED	% HOUSEHOLDS SEASONALLY OCCUPIED	% OWNEP OCCUPIED NONWHITE	% OWNER OCCUPIED)1 PERSON PER UNIT	UNITS BUILT PRIOR TO 1960	% UNITS BUILT PRIOR TO 1960	UNITS BUILT BETWEEN 3/75 AND 3/80	% UNITS BUILT BETWEEN 3/75 AND 3/80	MEDIAN HOUSEHOLD INCOME	MEDIAN OWNER OCCUPIED HOUSEHOLD INCOME	MEDIAN RENTER OCCUPIED HOUSEHOLD INCOME
TOWN	1530	1535	1540	1545	1550	1555	1560	1565	1570	1575	1580
Arlington	56.0%	1.7%	1.9%	85.1%	14,786	78.3%	377	2.0%	20,520	25,087	15,529
Ashland	98.8%	26.5%	1.7%	83.0%	1,955	61.8%	371	11.7%	23,611	27,301	14,842
Bedford	76.3%	1.8%	3.4%	92.5%	2,225	58.4%	210	5.5%	28,809	32,201	17,941
Belmont	59.9%	1.7%	1.7%	84.1%	8,653	87.5%	218	2.2%	23,432	28,960	18,507
Boston	27.2%	9.5%	18.2%	79.4%	202,264	83.8%	7,407	3.1%	12,390	20,627	10.410
Braintree	77.6%	2.0%	0.8%	89.2%	8,440	72.0%	881	7.5%	22,444	24,756	13,958
Brookline	33.3%	3.2%	6.4%	80.4%	32,680	76.6%	1,162	4.8%	19,546	32,680	15,085
Burlington	82.8%	1.5%	3.2%	94.6%	3,025	43.2%	414	5.9%	26,718	27.630	21,900
Cambridge	22.9%	6.0%	9.5%	71.7%	33,525	81.2%	1,208	2.9%	14,013	23,237	12,043
Canton	75.2%	2.8%	1.0%	91.2%	3,356	57.9%	573	9.9%	25,431	29,159	13,627
Chelsea	27.1%	7.2%	2.8%	82.8%	9,021	86.2%	409	3.9%	11,134	18,551	9,266
Dedham	78.8%	1.6%	0.8%	87.0%	6,452	76.7%	304	3.6%	22,219	24,472	13,321
Everett	40.9%	3.6%	1.8%	83.3%	13,177	89.9%	296	2.0%	15,586	20,495	12,391
Framingham	53.2%	2.7%	3.0%	88.8%	12,412	50.4%	1,000	4.1%	20,915	28,358	14,736
Hingham	84.1%	29.0%	0.9%	90.0%	4,462	68.5%	526	8.1%	27,236	30,287	16,807
Holbrook	82.9%	2.2%	3.4%	90.4%	2,716	77.2%	86	2.4%	21,073	22,649	11,638
Lexington	85.9%	1.1%	3.5%	89.5%	6,746	69.1%	701	7.2%	31,629	34.667	17,785
Lynn	46.0%	6.7%	2.2%	83.9%	27,826	85.3%	1,607	4.9%	14,143	20,395	9,773
Lynnfield	93.2%	1.3%	0.8%	91.1%	2,309	64.8%	308	8.6%	30.582	31,717	9,489
Malden	42.5%	3.4%	1.8%	86.1%	16,701	77.8%	729	3.4%	15,941	21,146	12,584
Marblehead	71.1%	4.7%	0.7%	83.2%	6,374	77.5%	258	3.1%	23,699	28,464	16,380
Medford	58.2%	2.1%	3.2%	85.3%	18,199	88.2%	639	3.1%	18,474	22,360	13,545
Melrose	65.9%	3.0%	0.8%	87.9%	8,714	79.6%	342	3.1%	21,141	25,337	11,861
Milton	83.6%	2.2%	2.2%	86.1%	7,487	87.5%	234	2.7%	24,376	26,367	15,448
Nahant	53.8%	7.3%	0.4%	75.1%	1,145	76.9%	85	5.7%	24,309	25,824	21,339
Natick	72.6%	2.6%	2.3%	89.2%	7,947	76.1%	711	6.8%	22,548	25,711	15,201
Needham	82.9%	1.4%	1.4%	88.3%	7,196	75.8%	353	3.7%	29,156	31,737	15,897
Newton	68.6%	2.3%	3.2%	87.5%	24,935	85.7%	1,285	4.4%	26,479	31,844	17,924
Norwood	58.4%	1.7%	0.7%	88.0%	6,972	65.8%	544	5.1%	21,527	25,289	17,059
Peabody	69.9%	2.7%	1.4%	89.3%	9,633	59.3%	772	4.8%	20,687	23,891	12,184
Quincy	49.0%	2.5%	0.9%	83.6%	26,049	76.0%	2,035	5.9%	17,230	22,513	12,893
Randolph	73.2%	2.1%	4.4%	90.9%	4,616	48.1%	775	8.1%	21,593	24,141	13,058
Peading	80.2%	2.4%	0.6%	91.4%	5,239	69.7%	392	5.2%	25,439	27,886	15,346
Revere	49.0%	4.7%	0.5%	85.2%	12,147	71.0%	930	5.4%	15,265	20,108	11,268
Saugus	79.3%	1.5%	0.7%	90.4%	5,893	71.0%	353	4.3%	21,161	22,580	13,321
Somerville	32.8%	4.1%	2.0%	83.2%	28,128	90.9%	806	2.6%	14,415	20,961	11,975
Stoneham	63.4%	1.9%	0.8%	89.6%	5,053	66.0%	445	5.8%	21,350	25,663	13,770
Stoughton	72.5%	2.1%	3.0%	89.7%	4,422	49.9%	774	8.7%	21,359	24,400	12,797
Swampscott	72.8%	3.3%	0.7%	85.4%	4,160	79.6%	351	67.2%	23,907	27,794	16,183
Wakefield	70.7%	1.9%	0.6%	88.3%	6,927	78.6%	376	4.3%	21,107	24,229	14,821
Walpole	82.8%	1.9%	0.5%	90.6%	3,626	62.7%	586	10.1%	25,092	27,186	14,109
Waltham	45.0%	3.0%	1.2%	86.3%	15,371	72.4%	1,062	5.0%	18,700	24,660	14,690
Watertown	47.1%	2.4%	1.0%	80.6%	11,533	85.1%	186	1.4%	19,260	22,814	16,527
Wellesley	80.8%	1.8%	1.6%	89.9%	6,984	81.3%	400	4.7%	32,452	36,213	13,950
Weston	88.3%	1.7%	2.2%	91.8%	2,150	64.6%	166	5.0%	47,657	50,645	19.651
Westwood	90.7%	1.2%	1.1%	90.7%	2,859	67.7%	161	3.8%	28,390	30,117	12,792
Weymouth	63.7%	2.3%	0.7%	87.9%	12,929	65.1%	1,215	6.1%	19,439	24,182	13,253
Wilmington	91.7%	2.1%	0.9%	91.9%	3,097	60.7%	323	6.3%	23,571	24,598	13,294
Winchester	77.4%	1.9%	1.8%	89.0%	5,438	78.5%	245	3.5%	29,092	33,722	16,578
Winthrop	47.5%	3.3%	0.5%	84.6%	6,230	82.2%	158	2.1%	18,281	23,410	14,494
Woburn	60.9%	2.6%	1.4%	89.7%	8,561	67.3%	871	6.9%	20,601	23,767	16,002
					692,745		36,620				

	% HOUSEHOLDS BELOW POVERTY LEVEL	% OWNER OCCUPIED HOUSEHOLDS BELOW POVERTY LEVEL	% RENTER OCCUPIED HOUSEHOLDS BELOW POVERTY LEVEL	SEWER USER DIFFERENTIATION (A= NO DIFF; B= RES vs IND; C = OTHER)	SEWER RATE STRUCTURE (A=ASCEND BLK; DESCEND BLK; F=FLAT;N=NONE)	SEWER RESIDENTIAL BILLING FREQUENCY (# BILLS PER YEAR)	IF DIFFERENT SEWER INDUS/ COMM BILLING FREQUENCY, # BILLS PER YEAR	SEWER + WATER JOINT BILLED (Y/N)	IF JOINT BILLED, SEWER + WATER SEPERATELY I.D'd	NEW DEV. MANAGED THROUGH SEWER SERVICES (Y/N)	SEWER SURCHARGE COLLECTIONS (Y/N)
TOWN	1585	1590	1595	2100	2105	2110	2115	2120	2125	2400	2405
Arlington	5.9%	3.3%	9.3%	A	F	2		Y	Y	Y	N
Ashland				A	A	2		Y	Y	Y	N
Bedford	4.6%	2.0%	13.1%	A	A	2	12	Y	Y	Y	N
Belmont	3.8%	2.1%	6.5%	A	F	4		Y	Y	Y	N
Boston	18.9%	7.4%	23.2%	A	A	4		Y	Y		N
Braintree	4.0%	2.8%	8.1%	A	F	4		Y	Y	Y	N
Brookline	8.5%	3.0%	11.2%	A	F	4		Y	Y	N	N
Burlington	3.0%	2.3%	6.1%	B	A	2	4	Y	Y	N	N
Cambridge	14.1%	4.7%	16.9%	A	F	2		Y	Y		
Canton	5.2%	4.1%	8.5%	A	F	3		Y	Y	Y	N
Chelsea	19.5%	6.9%	24.2%	A	F	4		Y	Y	N	N
Dedham	5.8%	4.0%	12.5%	A	N			N		N	N
Everett	11.3%	6.4%	14.8%	A	N	0		N		N	N
Framingham	6.5%	2.9%	10.6%	A	F	3		Y	Y	N	N
Hingham	3.6%	2.7%	8.5%								
Holbrook	5.9%	3.8%	16.3%	A	N	2		Y	Y	N	N
Lexington	3.7%	2.2%	13.2%	A	F	2		Y		N	N
Lynn	14.6%	6.3%	21.6%								
Lynnfield	3.9%	3.3%	12.6%								
Malden	10.3%	6.4%	13.1%	A	F	2		Y	Y	N	N
Marblehead	5.4%	4.1%	8.8%								
Medford	9.3%	6.3%	13.5%	A	F	2	4	Y	Y	N	N
Melrose	6.0%	3.4%	11.0%	C	A	2		Y	Y	N	N
Milton	3.7%	2.8%	8.0%	A	F	2		Y		Y	N
Nahant	NA	NA	NA					Y		N	
Natick	5.0%	3.0%	10.1%	A	F	4		Y	Y	Y	N
Needham	4.3%	3.0%	10.5%	A	F	2	12	Y	Y	Y	N
Newton	5.0%	3.0%	4.0%	A	A	2		Y	Y	N	N
Norwood	5.8%	3.7%	8.9%	A	F	4	12	Y	Y	N	N
Peabody	7.2%	4.3%	13.8%								
Quincy	9.1%	5.3%	12.7%	B	F	0	12	N		Y	N
Randolph	5.5%	3.9%	10.[illegible]	C	F	2		Y	Y	Y	N
Reading	3.7%	2.7%	7.6%	A	F	4		Y		Y	N
Revere	11.6%	7.2%	15.9%	A	F	2	12	Y	Y	N	N
Saugus	6.7%	5.1%	13.0%								
Somerville	13.5%	5.7%	17.3%	A	F	4	12	Y	Y		
Stoneham	5.9%	4.1%	9.1%	A	F	2		Y	Y		
Stoughton	6.3%	4.2%	11.9%	A	F	2		Y	Y	Y	N
Swampscott	5.2%	3.9%	8.6%								
Wakefield	5.0%	3.3%	9.2%	A	F	2	12	Y	Y	N	N
Walpole	2.9%	1.8%	8.1%	B	F	2	12	Y	Y	N	N
Waltham	8.6%	2.2%	13.8%	A	F	4	12	Y	Y	N	N
Watertown	6.4%	3.1%	9.4%	A	F	2		Y	Y	N	N
Wellesley	4.1%	2.3%	11.6%	C	A	6		Y		N	N
Weston	2.2%	1.8%	5.2%								
Westwood	3.6%	2.7%	12.1%	A	F	4		N		N	N
Weymouth	7.3%	4.7%	11.9%	C	A	1		N		Y	N
Wilmington	4.0%	3.3%	11.4%	A	F	4		Y	Y	Y	N
Winchester	3.6%	2.7%	6.6%	A	F	2		Y	Y	N	N
Winthrop	7.7%	4.4%	10.6%	A	F	4		Y	Y	N	N
Woburn	5.6%	3.7%	8.5%	B	F	2	12	Y	Y	Y	N

	1986 SEWER USER CHARGES	1987 SEWER USER CHARGES	SEWER ACCOUNTING (G=GEN FUND; S=SPEC REV; E=ENT FUND; O=OTHER)	SEWER ACTG BASIS (A=ACCRUAL; M=MOD.ACCRUAL; C=CASH)	FULL SEWER COST RECOVERY POLICY	FY1985 SEWER RATE REVENUE	FY1985 TOTAL SEWER REVENUE	FY1985 SEWER EXPENDITURES	FY1985 SEWER SURPLUS (DEFECIT)	FY1985 SEWER I/I EXPENDITURES	FY1985 SEWER SEP.OF SEWERS EXPENDITURES
TOWN	2700	2705	2710	2715	2720	2725	2730	2735	2740	2745	2750
Arlington	1,126,000	1,801,506	E	M	N	654,396	664,396	737,623	-73227		
Ashland	157,765		G				132,895	156,795	-23900		
Bedford	754,300		G		N	584,000	958,500	742,945	215555		
Belmont	532,256	711,738	S	C	Y	402,105	404,105	404,195	-90	0	
Boston	32,696,976		E	M	Y	24,939,000	31,092,000	31,092,000	0		
Braintree	1,300,000	1,300,000	E	C	Y	1,300,000	1,309,000	1,337,762	-28762	0	0
Brookline	1,490,224	2,065,000	E	M	Y	1,122,690	1,122,690	1,144,158	-21468	12,000	0
Burlington	450,800	450,000	G	M	N	499,567	499,567	1,496,834	(997,267)	46,347	0
Cambridge	4,305,956	5,932,445	G	M	N		3,781,353	3,357,590	423763		
Canton	500,000		E	M	Y	0	34,125	328,010	-293885	0	0
Chelsea	0	881,900	G	M	N	0	0	433,973	-433973	0	0
Dedham	0	0	G		N	0	0	60,406	-60406	80,000	0
Everett	0	0	O		N	0	0	528,012	-528012		
Framingham	1,660,417	2,497,499	S		N	1,010,446	1,219,815	1,581,085	-361270	0	0
Hingham									0		
Holbrook	44,500	98,000	G	C	N	38,590	41,090	100,000	-58910	0	0
Lexington	569,936	614,936	G			200,000	200,000	1,204,946	-1004946		
Lynn									0		
Lynnfield									0		
Malden	903,619	2,313,876	G	M	Y				0		
Marblehead									0		
Medford	1,913,836	2,342,938	E	M	Y	1,204,455	1,204,455	84,027	1120428		
Melrose	446,162	777,162	G	M	N	39,373	39,373	531,000	-491627	0	0
Milton	636,997		S		Y	614,196	696,805	104,910	591895	0	0
Nahant									0		
Natick	579,536		S	M	N	458,476	458,476	690,493	-232017	37,531	
Needham	65,000	462,545	G	C	N	0	124,696	221,734	-97038	0	0
Newton	2,300,000	3,240,000	S	M	N	1,985,716	2,166,970	2,031,851	135119		
Norwood	706,760	1,240,000	G	C	N	440,366	520,128	597,146	-77018	117,397	0
Pea ody		0							0		
Quincy	369,000	200,000	G				393,000		393000	0	0
Randolph	510,000	510,000 6	G	C	N	455,000	1,225,000	1,477,232	-252232	7,000	0
Reading	1,041,054		E			857,292	857,292	900,172	-42880		
Revere	0	2,300,000	G		N	0	0	1,568,913	-1568913	500,000	0
Saugus									0		
Somerville	1,673,102	1,673,102	G	M	N		2,013,649	1,330,617	683032		
Stoneham	705,430	990,000	G	M	N	602,273	1,283,403	997,907	285496	76,187	92,502
Stoughton	500,000	650,000	S	C	Y		541,736	1,305,695	-763959	25,000	0
Swampscott									0		
Wakefield	0	1,114,000	S	A	N	0	0	377,093	-377093	48,725	0
Walpole	217,165	485,000	G	C	N	188,413	2,905,082	3,868,310	-963228		
Waltham	1,900,000	3,100,000	E	M	N	1,939,991	2,071,128	1,826,418	244710	0	0
Watertown	681,069	1,019,000	G	A	N			930,307	-930307		
Wellesley	1,163,500		E			936,723	1,604,958	1,505,792	99166	0	0
Weston									0		
Westwood	307,008		G	M	N	197,364	2,496,849	7,293,074	-4796225	22,426	0
Weymouth	1,067,000	1,200,000	E	A		893,251	1,003,251	2,171,098	-1167847	77,074	0
Wilmington	412,777		G	M	N	384,323	384,323	770,900	-386577	0	0
Winchester	451,476	850,000	S			462,378	462,841	588,800	-125959	0	0
Winthrop	658,945	1,268,435	G	M	Y	326,453	326,452	882,507	-556055	0	0
Woburn	866,956	1,442,000	G	M	N		868,326	1,044,231	-175905	0	69,750
	65,665,582	43,531,082				42,736,837	65,107,729	77,806,561	(12,698,832)	1,049,687	162,252

	WATER USER DIFFERENTIATION (A= NO DIFF) (B=DIF RES + IND) (C = OTHER)	WATER RATE STRUCTURE (F=FLAT;A=ASCEND BLK;D=DESCEND BLK)	WATER RESIDENTIAL BILLING FREQUENCY (# BILLS PER YR)	IF DIFFERENT WATER INDUS/ COMM BILLING FREQUENCY, # BILLS PER YEAR	SEWER + WATER JOINT BILLED (Y/N)	IF JOINT BILLED, SEWER + WATER SEPERATELY I.D'd	NEW DEV. MANAGED THROUGH WATER SERVICES (Y/N)	FY 1986 WATER USER CHARGES	FY 1987 WATER USER CHARGES	WATER ACCOUNTING (G=GEN FUND; S=SPEC REV; E=ENT FUND; O=OTHER)	WATER ACCTG BASIS (A=ACCRUAL; M=MOD.ACCRUAL)
TOWN	3100	3105	3110	3115	3120	3125	3400	3700	3705	3710	3715
Arlington	N	F	2		Y	Y	Y	1,607,374	1,607,374	E	M
Ashland											
Bedford	A	A	4	12	Y	Y	Y	682,500		G	
Belmont	A	A	4		Y	Y	N	930,000	1,012,000	S	C
Boston	A	A	4		Y	Y		32,069,000		E	M
Braintree											
Brookline	A	F	4		Y	Y	Y	3,034,665	3,425,000	E	M
Burlington			2	4	Y	Y				G	M
Cambridge		F									
Canton	A	F	3		Y	Y	Y			E	A
Chelsea	A	F	4		Y	Y	N	1,017,000	1,265,000	G	M
Dedham											
Everett	A	F	4	12	N		N	1,500,000	1,500,000	G	
Framingham	A	F	3		Y	Y	N	1,909,928	1,909,928	G	
Hingham											
Holbrook			2		Y	Y	N				
Lexington	A	F	2		Y		N	1,129,384	1,229,384	S	M
Lynn	A	D	4								
Lynnfield	A	D	2	4	N		N	160,000	160,000	S	C
Malden	A	F	2		Y	Y	N	1,362,581	1,745,360	G	M
Marblehead	A	F	2		N		N	765,492	765,492	S	C
Medford	A	F	2	4	Y	Y	N	1,600,000	2,342,000	E	M
Melrose	C	A	2		Y	Y	N	885,131	885,131	G	M
Milton	A	F	2		Y		Y	776,481		E	
Nahant	A	F	2		Y		N	100,000	100,000	G	
Natick			4		Y	Y		1,136,062		S	M
Needham	A	F	2		Y	Y	N	1,300,000	1,300,000	G	C
Newton	A	A	2		Y	Y	N	3,060,000	4,320,000	S	M
Norwood	B	D	4	12	Y	Y	N	984,646	1,160,000	G	M
Peabody	A	F	4		N		N	2,166,000	2,100,000	G	
Quincy	A	A	2	12	Y		Y	3,727,000	4,000,000		
Randolph		F									
Reading											
Revere	A	F	2	12	Y	Y	Y	1,100,000	1,200,000	G	
Saugus	C	F	2				Y	577,369			
Somerville	A	F	4	12	Y	Y		2,211,898	2,211,898	G	M
Stoneham	A	F	2		Y	Y		737,000	785,000	S	M
Stoughton			2		Y	Y	N				
Swampscott	A	F	2		N		N	433,575	433,575	S	M
Wakefield	A	F	2	12	Y	Y	N	1,231,000	1,000,020	S	A
Walpole											
Waltham	A	F	4	12	Y	Y	N	2,900,000	3,200,000	E	M
Watertown	A	F	2		Y	Y	N	1,118,412	1,118,411	G	A
Wellesley	C	A	6		Y		N	1,582,000		E	
Weston	A	F	2				N	375,000	375,000	G	C
Westwood											
Weymouth											
Wilmington		D	4		Y	Y					
Winchester	A	F	2		Y	Y	N	793,016	783,000	S	
Winthrop	B	F	4		Y	Y	N	655,166	655,166	G	M
Woburn	B	F	2	12	Y	Y	N	1,028,039	1,567,000	G	M
								76,645,719	44,155,739		

	FULL WATER COST RECOVERY POLICY	FY1985 WATER RATE REVENUE	FY1985 TOTAL WATER REVENUE	FY1985 WATER EXPENDITURES	FY1985 WATER SURPLUS (DEFECIT)	FY1985 WATER LEAKAGE ELIMINATION EXPENDITURES	CY1985 TOTAL WATER DELIVERED METERED IN MG	CY1985 TOTAL WATER DELIVERED UNMETERED	WATER SERVICE CONNECTIONS EXIXTING ON 12/31/85	PUBLIC HYDRANTS EXISTING ON 12/31/85	PRIVATE FIRE PROTECTION CONNECTIONS 12/31/85
TOWN	3720	3725	3730	3735	3740	3745	4100	4105	4110	4115	4120
Arlington	N	1,404,300	1,610,000	1,525,431	84,569		1440.00	371.00	12,500	1,346	50
Ashland					0						
Bedford	N	660,000	660,000	1,131,188	(471,188)		520.00	20.00	3,481	680	
Belmont	Y	790,307	790,307	788,472	1,835	0	874.89	150.53	7,176	685	37
Boston	Y	29,459,000	37,552,000	37,552,000	0		43508.00		88,644	13,300	3,919
Braintree					0		1207.20			1,150	
Brookline	Y	2,646,224	2,696,224	2,679,046	17,178	26,700	2056.95	40.00	9,567	1,475	295
Burlington	N						1034.08	0.50	6,800	250	
Cambridge					0						
Canton	Y	1,762,064	1,793,029	811,697	981,332	30,008	1123.20	138.80	5,223	938	150
Chelsea	N	1,022,852	1,022,852	897,159	125,693	0	1134.88	85.40	4,518	517	108
Dedham					0						
Everett		1,449,157	1,449,657	1,339,460	110,197		2718.00		7805.00	656	95
Framingham	Y	1,412,565	1,581,969	2,040,147	(458,178)	0	2904.70	506.87	15,714	3,008	
Hingham					0						
Holbrook					0		43.60	316.00	3,100	332	20
Lexington	N	1,264,120	1,264,120	1,208,604	55,516		1528.89	9678.00	1,475	1,475	
Lynn					0						
Lynnfield	Y	152,000	391,200	815,000	(423,800)	195,826	132.84	4.00	1,148	212	15
Malden	Y				0		1329.00		11,500	1,168	226
Marblehead	N	577,027	620,304	846,839	(226,535)		614.96		7,262	700	55
Medford	N	1,479,703	1,813,810	1,808,256	5,554				14,000	1,300	
Melrose	N	870,048	870,048	776,691	93,357		791.00		7,922	824	0
Milton	Y	765,396	999,355	742,663	256,692						
Nahant	N	93,000	107,000	159,630	(52,630)		161.00	3.01	1,328	180	3
Natick	N				0			1092.69	9,800	1,022	
Needham	N	1,105,938	1,326,068	1,263,504	62,564	351,185	1211.30	1.00		1,252	125
Newton	N	2,836,236	3,215,395	2,799,360	416,035		3687.07		24,006	23,000	1,000
Norwood	N	990,213	1,012,783	853,230	159,553		1260.38		7,500	950	190
Peabody	N	1,980,049	2,106,435	1,650,000	456,435		1706.00	100.00	12,000	1,207	126
Quincy		3,752,000	4,099,000	5,469,000	(1,370,000)						
Randolph					0						
Reading					0		841.00	12.00	6,800	1,400	105
Revere		1,100,000	1,100,000	1,335,262	(235,262)	0			6,000	250	
Saugus					0		668.15	92.03	7,573	812	82
Somerville	N		3,020,473	2,139,090	881,383						
Stoneham	N	722,598	796,598	563,728	232,870		900.00	90.00	5,640	565	90
Stoughton					0				9,000		
Swampscott	N	433,575	454,575	408,110	46,465	0	717.00		4,400	472	25
Wakefield	N	1,161,878	1,175,002	938,965	236,037	4,500	979.41	49.77	7,265	651	
Walpole					0		574.99	15.00		1,000	
Waltham	N	2,941,183	3,116,362	2,958,918	157,444	0	3830.00	0.00	13,000	1,200	270
Watertown	N			882,455	(882,455)		994.04		8,347	919	129
Wellesley		1,537,470	1,634,000	2,883,792	(1,249,792)	0	825.00	10.00	8,161	1,142	75
Weston	N	310,362	387,412	343,970	43,442		390.60	0.30	3,157	751	12
Westwood					0						
Weymouth					0		1422.00	281.00	14,380	1,171	
Wilmington					0		117.00	4.00	5,414	850	
Winchester		792,800	851,596	1,003,670	(152,074)		854.50	0.00	6,515	1,021	
Winthrop	Y	676,679	908,420	623,066	285,354	0	734859.00	0.00	4,505	467	20
Woburn	N		905,715	1,032,023	(126,308)	0	2443.57		11,438	1,200	
		66,148,744	81,331,709	82,270,426	(938,717)	608,219	821,404	13,062	384,064	71,578	7,222

	METERS WORKING AS OF 12/31/85	METERS NOT WORKING AS OF 12/31/85	WATER SERVICE CONNECTIONS NOT METERED 12/31/85	MILES OF WATER MAIN)= 4 INCHES 12/31/85	TOTAL NUMBER OF MILES OF SEWER MAIN 12/31/85	SEWER FLOW % FROM STORM SEWERS	LEAKAGE/PIPE REPAIR PROGRAMS (Y/N)	METER PROGRAMS (M=MAINTENANCE; E=EXPANSION; B=BOTH)	INDUSTRIAL PRETREATMENT PROGRAMS (Y/N)	OUTSIDE GRANTS RECIEVED (Y/N)	WOULD WELCOME MWRA TECH. ASSISTANCE (Y/N)
TOWN	4125	4130	4135	4140	4145	4150	4400	4405	4410	4415	4420
Arlington	12,500	0		130	117	0	Y	B	NA	Y	Y
Ashland											
Bedford	3,429	52	15	70	45	NA	Y	B		Y	Y
Belmont	7,151	25	0	90	76	0	Y	B	Y	Y	N
Boston	87,062	1,582	0	1,075	1,340	0	Y	B	N	N	N
Braintree	10,300	0	0	172	135	0	Y	B	N	Y	Y
Brookline	9,400	167	0	135	92	1	Y	B	N	Y	Y
Burlington	6,551	249	0	120	113	0	Y	M	Y	Y	N
Cambridge											
Canton	4,407	400	32	95	70	0	Y	M	N	Y	N
Chelsea	4,518	0	0	64	40	50	N	M	N	N	Y
Dedham								M	N	N	Y
Everett	7,005	800	12	69	58		N	M		Y	Y
Framingham	15,474	553	0	228	196	0	Y	M	N	Y	Y
Hingham											
Holbrook	210		900	49	21		Y	M	Y	N	N
Lexington	9,678	0	0	154	153	0	Y	M		Y	Y
Lynn											
Lynnfield		0	0	27	0	0	Y	B	N	Y	N
Malden	11,350	150	12	117	99	0	Y	B	Y	Y	Y
Marblehead		0		96		0	Y	M	N	Y	Y
Medford	13,000	1,000	12	120	110	10	Y	B	N	Y	Y
Melrose	7,814	68	0	75	75	0	Y	M	N	N	Y
Milton						0	Y	B	N	Y	Y
Nahant	1,303	25	4	23	21		Y	M	N	Y	Y
Natick	9,300	50	0	80	89	0	Y	B	N	Y	Y
Needham	9,496	0	0	133	115	0	Y	B	Y	Y	Y
Newton	23,526	400	0	299	284	0	N	M	N	N	N
Norwood	7,350	150	0	115	95	0	Y	M	N	Y	Y
Peabody	10,966	1,034	127	180	165	0	N	B	N	Y	N
Quincy						0	Y	M	Y	Y	Y
Randolph							Y	M	N	Y	N
Reading	6,700	100	0	100	90		Y	B	N	Y	N
Revere	5,400	600		99	99	0	N	B	N	Y	Y
Saugus	7,000	573	751	160	150		Y	B		N	
Somerville							Y	B			
Stoneham	5,515	100	25	74	65	0	Y	M	N	Y	
Stoughton					57	0	Y	M	N	Y	Y
Swampscott	4,370	30	0	52	0	0	Y	B	N	N	Y
Wakefield	7,265	0	12	86		0	Y	M	Y	Y	Y
Walpole			0	106	40		Y	M	N	N	Y
Waltham	13,000	0	35	155	144	0	N	N	N	Y	Y
Watertown	8,377	0	0	82	80		Y	M	N	Y	Y
Wellesley	8,161	0	0	149	25	0	Y	M	N	Y	N
Weston	3,150	7	0	105	0	0	N	B	N	N	Y
Westwood							N	N	N	N	Y
Weymouth	14,374	6	0	198	166	0	Y	M	N	Y	Y
Wilmington	5,335	20	49	115	18	0	Y	B	N	Y	N
Winchester	6,509	6	0	104	82	0	Y	B	N	Y	Y
Winthrop	4,460	45	0		35		Y	M	N	Y	Y
Woburn			1,200	240	135	0	Y	M	N	Y	N
	371,406	8,272	3,186	5,539	4,694	61					

TOWN	FY86 TOTAL TAX LEVY	FY86 RESIDENTIAL TAX LEVY	FY86 OPEN SPACE TAX LEVY	FY86 COMMERCIAL TAX LEVY	FY86 INDUSTRIAL TAX LEVY	FY86 PERSONAL PROPERTY TAX LEVY	FY86 TOTAL ASSESSED TAX VALUATION	FY86 RESIDENTIAL ASSESSED TAX VALUATION	FY86 OPEN SPACE ASSESSED TAX VALUATION	FY86 COMMERCIAL ASSESSED TAX VALUATION	FY86 INDUSTRIAL ASSESSED TAX VALUATION
TOWN	5100	5105	5110	5115	5120	5125	5200	5205	5210	5215	5220
Arlington	30,202,293	27,183,604	164,210	2,146,158	283,449	424,372	1,831,552,000	1,648,489,800	9,959,300	130,179,700	17,187,700
Ashland	7,454,364	6,007,211	111,771	541,358	623,759	170,265	354,969,730	286,057,570	5,322.300	25,779.060	29,703.000
Bedford	13,246,500	5,496,715	95,759	2,998,000	4,294,648	361,298	824,835,168	436,441,600	10,137,700	148,162.400	212,237,800
Belmont	20,882,983	18,894,380		1,773,571	118,198	96,834	1,440,205,700	1,303,060,400		122,315,900	8,151,300
Boston	394,592,935	123,789,327		201,404,575	25,937,383	43,461,650	19,672,482,765	9,196,186,033		7,791,521,056	1,003,423,000
Braintree	23,466,941	13,060,972		7,762,958	266,648	379,363	1,533,422,988	989,450,400		4,058,092	118,489,900
Brookline	50,978,463	41,720,009		7,589,317	149,010	1,520,127	2,195,025,447	1,910,275,681		233,414,321	4,584,400
Burlington	23,048,819	8,231,859		9,861,377	4,435,873	519,710	1,261,488,100	587,989,900		448,244,400	201.630,600
Cambridge	74,326,924	28,534,255		30,637,558	11,732,951	3,422,160	3,616,211,487	2,130,917,311		993,734,313	380,559,863
Canton	13,511,584	8,777,341	26,929	1,964,314	2,414,520	328,480	906,789,900	617,697,542	1,895,400	119,844.658	147,311,500
Chelsea	9,545,270	3,527,064		3,801,271	1,616,433	600,502	474,364,088	269,664,428		129,294,050	54,980,400
Dedham	16,220,965	9,754,607		4,089,792	1,654,717	721,849	1,017,233,230	746,892,600		170,982.800	69.179.200
Everett	29,478,362	8,111,531		2,811,882	8,340,107	10,214,842	1,413,115,428	598,224,695		107,240,049	318,076,283
Framingham	46,210,452	28,320,755	376,416	12,319,570	3,878,913	1,314,798	2,530,925,900	1,740,673,300	23,135,600	539,622,000	169,904.200
Hingham	16,642,259	13,258,172	356,860	1,036,407	816,486	374,334	708,181,220	564,177,800	15,185,690	78,144,865	34,744,045
Holbrook	5,934,475	4,326,120	50,556	553,627	617,909	386,263	282,839,875	221,846,400	2,592,300	20,755,075	23,165,210
Lexington	31,019,097	21,262,004	165,952	5,073,497	2,652,474	1,165,170	1,338,290,900	1,013,020,200	7,944,200	192,321,300	86,853,000
Lynn	38,417,319	24,177,825		6,388,070	5,704,741	2,146,683	1,608,156,689	1,210,777,700		178,270,600	159,201,700
Lynnfield	8,642,833	7,860,389	2,705	640,771	12,065	126,903	474,880,753	431,889,444	148,700	35.207,228	663,000
Malden	24,545,218	17,877,264		3,528,719	2,108,827	1,030,408	1,302,675,050	1,040,536,950		138,724,700	82,904,600
Marblehead	17,238,050	16,024,646	483	992,774	140,232	79,916	1,436,504,129	1,335,387,700	39,800	82,731,500	11,686,200
Medford	29,373,894	21,799,219		5,694,247	1,193,696	686,732	1,726,751,677	1,429,898,250		223,158,300	46,781,800
Melrose	16,331,157	14,705,015		1,036,947	229,632	359,563	683,292,875	621,470,340		39,422,500	8,730,000
Milton	16,757,715	15,705,414	8,044	637,061	97,312	309,884	859,369,930	805,405,850	412,900	32,663,500	4,990,600
Nahant	2,808,556	2,679,059		73,949	697	54,851	131,733,385	125,659,400		3,468,500	32,700
Natick	21,347,901	15,578,225	86,544	4,079,135	1,304,613	299,383	1,524,850,040	1,112,730,400	6,182,200	291,366,600	93,185,900
Needham	24,497,522	18,158,347		3,977,075	1,808,138	553,962	1,473,978,410	1,092,560,330		239,293,800	108,793,630
Newton	82,325,630	60,303,195		16,292,160	2,943,141	2,787,134	3,574,670,312	2,937,177,495		471,616,587	85,195,900
Norwood	17,675,985	10,800,981	8,520	3,228,625	3,309,545	328,314	946,435,100	599,933,400	473,500	162,702,600	166,780.500
Peabody											
Quincy	48,240,527	30,275,803		10,982,245	4,528,097	2,454,382	2,056,770,030	1,467,585,300		360.181,000	148.507,400
Randolph	15,364,146	11,709,707		1,040,440	1,319,135	494,864	629,498,019	489,560,041		70,475,595	50,512,786
Reading	15,693,497	13,706,418	17,514	1,430,227	305,254	234,004	651,723,300	569,203,400	727,200	59,394,900	12.676,900
Revere	21,116,317	13,661,856		6,155,026	360,371	939,064	916,255,639	700,244,362		178,356,988	10,442,430
Saugus	16,334,751	9,875,419	49,658	4,018,316	1,604,987	786,371	793,186,800	568,014,200	2,856,500	139,373,400	55,668,500
Somerville	31,006,938	19,976,158		7,498,160	2,185,586	1,347,034	1,967,155,654	1,500,608,654		317,134,337	92,439,400
Stoneham	14,090,613	11,823,335		1,775,741	243,655	247,882	669,387,200	561,679,000		84.358,200	11,575,000
Stoughton	14,298,554	10,250,919	26,023	1,754,104	1,603,340	664,168	592,019,604	444,430,200	1,127,800	63,881,896	58,391,600
Swampscott	11,229,135	9,857,542		1,038,560	75,246	257,787	478,070,023	436,367,700		31,576.930	2,287,700
Wakefield	17,723,926	12,594,639	40,145	3,232,117	1,606,745	250,280	721,464,600	553,973,300	1,765,600	105,252,700	52,323.000
Walpole	12,433,797	9,541,671	93,067	1,336,944	913,921	548,194	534,786,954	410,394,680	4,002,680	57,502.870	39,308,700
Waltham	38,750,488	16,809,497		13,227,169	7,071,654	1,642,168	2,378,285,800	1,426,649,600		573,694,200	306,716,400
Watertown	24,231,467	15,762,133		4,128,436	3,760,457	580,441	1,467,423,957	1,103,755,517		177,272,790	161,472,200
Wellesley	25,692,292	21,386,927		4,030,388	78,526	196,451	1,552,404,410	1,292,261,475		243,528,000	4,744,800
Weston	12,828,770	11,978,710	152,701	590,072	14,856	91,431	778,444,760	726,863,100	9,266,200	35,805.200	901,200
Westwood	14,039,587	8,844,603	337	2,168,835	2,689,887	335,925	717,391,261	502,768,350	19,450	89,599,960	111,125,100
Weymouth	26,280,881	20,807,677		3,208,081	996,729	1,268,394	997,973,815	816,589,083		106,317,847	33.031,920
Wilmington	16,310,580	6,649,628	90,116	2,162,049	7,149,971	258,816	930,377,655	485,374,000	6,577,300	99,040,500	327,530.400
Winchester	19,459,619	17,431,771	348,502	906,001	386,974	386,371	811,493,720	726,929,500	14,533,400	37,781,600	16.137.200
Winthrop	6,784,211	6,389,100		227,012	2,085	116,014	434,885,370	409,557,710		17,757,200	133,660
Woburn	22,773,473	8,930,731	3,302	6,652,154	5,927,480	1,259,806	1,222,474,444	684,660,790	252.220	258,386,559	230,240,128
	1,531,408,035	884,189,749	2,276,114	422,896,922	131,511,073	88,585,677	78,446,705,351	52,881,962,881	124,557,940	16,260,919,126	5,375,294,355

	FY86 PERSONAL PROPERTY ASSESSED TAX VALUATION
TOWN	5225
Arlington	25,735,500
Ashland	8,107,800
Bedford	17,855,668
Belmont	6,670,100
Boston	1,681,352,676
Braintree	19,673,488
Brookline	46,751,045
Burlington	23,623,200
Cambridge	111,000,000
Canton	20,040,800
Chelsea	20,425,210
Dedham	30,178,630
Everett	389,574,401
Framingham	57,590,800
Hingham	15,928,820
Holbrook	14,480,830
Lexington	38,152,200
Lynn	59,306,689
Lynnfield	6,972,381
Malden	40,508,800
Marblehead	6,658,929
Medford	26,313,327
Melrose	13,670,035
Milton	15,031,140
Nahant	2,572,785
Natick	21,384,940
Needham	33,330,650
Newton	80,680,330
Norwood	16,545,100
Peabody	
Quincy	80,496,330
Randolph	18,949,597
Reading	9,720,900
Revere	27,211,859
Saugus	27,274,200
Somerville	56,973,263
Stoneham	11,775,000
Stoughton	24,188,108
Swampscott	7,037,693
Wakefield	8,150,000
Walpole	23,578,024
Waltham	71,225,600
Watertown	24,923,450
Wellesley	11,870,135
Weston	5,609,060
Westwood	13,878,401
Weymouth	42,034,965
Wilmington	11,855,455
Winchester	16,112,020
Winthrop	7,436,800
Woburn	48,934,747
	3,402,219,941

Attachment B

COMMUNITY FISCAL ANALYSES

The following schedules present, by community, the estimated fiscal impact of the current water and sewer rate methodologies.

Each schedule is composed of three sections. The first section presents the community's FY 1985 revenue and expenditure data for water, sewer, and combined water and sewer functions. These FY 1985 figures were utilized because they represent the most recently available community fiscal data. The second section summarizes MWRA FY 1986 and FY 1987 water and sewer charges under the current methodology. These years are the first years of the Authority's existence. The dollar and percentage increase of FY 1987 over FY 1986 is then calculated.

The final section of the analysis presents a comparison of the FY 1986 and FY 1987 MWRA wholesale charges as percentages of FY 1985 community costs and rate revenues. The resultant percentages indicate the estimated impact of the current methodologies for FY 1986 and FY 1987 upon the most recent (FY 1985) community fiscal data. Because more recent community data is not presently available, same-year comparisons of Authority charges to local water and sewer operations was not performed. Table VI.2 (in chapter VI) summarizes the individual community impacts presented on the following schedules.

Communities not utilizing MWRA water and sewer services are footnoted accordingly.

COMMUNITY FISCAL IMPACT

ARLINGTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,525,431	$737,623	$2,263,054
FY 1985 Rate Revenues	$1,404,300	$654,396	$2,058,696
FY 1985 Total Revenues	$1,610,000	$664,396	$2,274,396
Total Revenues less Costs (Subsidy) Surplus	$84,569	($73,227)	$11,342

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$486,875	$782,657	$1,269,532
FY 1987 MWRA Charge (Current Method)	$588,702	$1,382,130	$1,970,832
MWRA Charge Increase ($)	$101,827	$599,473	$701,300
MWRA Charge Increase (%)	20.91%	76.59%	55.24%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	31.92%	38.59%
Community Water Rate Revenues	34.67%	41.92%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	106.11%	187.38%
Community Sewer Rate Revenues	119.60%	211.21%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	56.10%	87.09%
Community Water/Sewer Rate Revenues	61.67%	95.73%

COMMUNITY FISCAL IMPACT

ASHLAND

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$156,795	$156,795
FY 1985 Rate Revenues	$0	$132,895	$132,895
FY 1985 Total Revenues	$0	$132,895	$132,895
Total Revenues less Costs (Subsidy) Surplus	$0	($23,900)	($23,900)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$79,588	$79,588
FY 1987 MWRA Charge (Current Method)	$0	$216,077	$216,077
MWRA Charge Increase ($)	$0	$136,489	$136,489
MWRA Charge Increase (%)	*	171.49%	171.49%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	50.76%	137.81%
Community Sewer Rate Revenues	59.89%	162.59%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	50.76%	137.81%
Community Water/Sewer Rate Revenues	59.89%	162.59%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

BEDFORD

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,131,188	$742,945	$1,874,133
FY 1985 Rate Revenues	$660,000	$584,000	$1,244,000
FY 1985 Total Revenues	$660,000	$958,500	$1,618,500
Total Revenues less Costs (Subsidy) Surplus	($471,188)	$215,555	($255,633)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$200,669	$200,669
FY 1987 MWRA Charge (Current Method)	$0	$375,367	$375,367
MWRA Charge Increase ($)	$0	$174,698	$174,698
MWRA Charge Increase (%)	ERR	87.06%	87.06%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	0.00%	0.00%
Community Water Rate Revenues	0.00%	0.00%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	27.01%	50.52%
Community Sewer Rate Revenues	34.36%	64.28%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	10.71%	20.03%
Community Water/Sewer Rate Revenues	16.13%	30.17%

COMMUNITY FISCAL IMPACT

BELMONT

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$788,472	$404,195	$1,192,667
FY 1985 Rate Revenues	$790,307	$402,105	$1,192,412
FY 1985 Total Revenues	$790,307	$404,105	$1,194,412
Total Revenues less Costs (Subsidy) Surplus	$1,835	($90)	$1,745

MWRA CHARGES			
FY 1986 MWRA Charge	$276,523	$426,256	$702,779
FY 1987 MWRA Charge (Current Method)	$333,260	$751,673	$1,084,933
MWRA Charge Increase ($)	$56,737	$325,417	$382,154
MWRA Charge Increase (%)	20.52%	76.34%	54.38%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	35.07%	42.27%
Community Water Rate Revenues	34.99%	42.17%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	105.46%	185.97%
Community Sewer Rate Revenues	106.01%	186.93%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	58.92%	90.97%
Community Water/Sewer Rate Revenues	58.94%	90.99%

COMMUNITY FISCAL IMPACT

BOSTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$37,552,000	$31,092,000	$68,644,000
FY 1985 Rate Revenues	$29,459,000	$24,939,000	$54,398,000
FY 1985 Total Revenues	$37,552,000	$31,092,000	$68,644,000
Total Revenues less Costs (Subsidy) Surplus	$0	$0	$0

MWRA CHARGES			
FY 1986 MWRA Charge	$11,549,965	$10,100,547	$21,650,512
FY 1987 MWRA Charge (Current Method)	$14,141,028	$18,101,887	$32,242,915
MWRA Charge Increase ($)	$2,591,063	$8,001,340	$10,592,403
MWRA Charge Increase (%)	22.43%	79.22%	48.92%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	30.76%	37.66%
Community Water Rate Revenues	39.21%	48.00%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	32.49%	58.22%
Community Sewer Rate Revenues	40.50%	72.58%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	31.54%	46.97%
Community Water/Sewer Rate Revenues	39.80%	59.27%

COMMUNITY FISCAL IMPACT

BRAINTREE

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$1,337,762	$1,337,762
FY 1985 Rate Revenues	$0	$1,300,000	$1,300,000
FY 1985 Total Revenues	$0	$1,309,000	$1,309,000
Total Revenues less Costs (Subsidy) Surplus	$0	($28,762)	($28,762)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$607,199	$607,199
FY 1987 MWRA Charge (Current Method)	$0	$1,068,290	$1,068,290
MWRA Charge Increase ($)	$0	$461,091	$461,091
MWRA Charge Increase (%)	*	75.94%	75.94%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	45.39%	79.86%
Community Sewer Rate Revenues	46.71%	82.18%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	45.39%	79.86%
Community Water/Sewer Rate Revenues	46.71%	82.18%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

BROOKLINE

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$2,679,046	$1,144,158	$3,823,204
FY 1985 Rate Revenues	$2,646,224	$1,122,690	$3,768,914
FY 1985 Total Revenues	$2,696,224	$1,122,690	$3,818,914
Total Revenues less Costs (Subsidy) Surplus	$17,178	($21,468)	($4,290)

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$675,976	$906,464	$1,582,440
FY 1987 MWRA Charge (Current Method)	$874,027	$1,591,118	$2,465,145
MWRA Charge Increase ($)	$198,051	$684,654	$882,705
MWRA Charge Increase (%)	29.30%	75.53%	55.78%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	25.23%	32.62%
Community Water Rate Revenues	25.54%	33.03%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	79.23%	139.06%
Community Sewer Rate Revenues	80.74%	141.72%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	41.39%	64.48%
Community Water/Sewer Rate Revenues	41.99%	65.41%

COMMUNITY FISCAL IMPACT

BURLINGTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$1,496,834	$1,496,834
FY 1985 Rate Revenues	$0	$499,567	$499,567
FY 1985 Total Revenues	$0	$499,567	$499,567
Total Revenues less Costs (Subsidy) Surplus	$0	($997,267)	($997,267)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$366,840	$366,840
FY 1987 MWRA Charge (Current Method)	$0	$687,781	$687,781
MWRA Charge Increase ($)	$0	$320,941	$320,941
MWRA Charge Increase (%)	*	87.49%	87.49%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	24.51%	45.95%
Community Sewer Rate Revenues	73.43%	137.68%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	24.51%	45.95%
Community Water/Sewer Rate Revenues	73.43%	137.68%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

CAMBRIDGE

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$3,357,590	$3,357,590
FY 1985 Rate Revenues	$0	$3,781,353	$3,781,353
FY 1985 Total Revenues	$0	$3,781,353	$3,781,353
Total Revenues less Costs (Subsidy) Surplus	$0	$423,763	$423,763

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$1,954,601	$1,954,601
FY 1987 MWRA Charge (Current Method)	$62,888	$3,279,918	$3,342,806
MWRA Charge Increase ($)	$62,888	$1,325,317	$1,388,205
MWRA Charge Increase (%)		67.80%	71.02%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs		
Community Water Rate Revenues		
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	58.21%	97.69%
Community Sewer Rate Revenues	51.69%	86.74%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	58.21%	99.56%
Community Water/Sewer Rate Revenues	51.69%	88.40%

Water usage on emergency basis only;
Costs not segregated

COMMUNITY FISCAL IMPACT

CANTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$811,697	$328,010	$1,139,707
FY 1985 Rate Revenues	$1,762,064	$34,125	$1,796,189
FY 1985 Total Revenues	$1,793,029	$34,125	$1,827,154
Total Revenues less Costs (Subsidy) Surplus	$981,332	($293,885)	$687,447

MWRA CHARGES			
FY 1986 MWRA Charge	$175,383	$246,967	$422,350
FY 1987 MWRA Charge (Current Method)	$269,999	$445,263	$715,262
MWRA Charge Increase ($)	$94,616	$198,296	$292,912
MWRA Charge Increase (%)	53.95%	80.29%	69.35%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	21.61%	33.26%
Community Water Rate Revenues	9.95%	15.32%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	75.29%	135.75%
Community Sewer Rate Revenues	723.71%	1304.80%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	37.06%	62.76%
Community Water/Sewer Rate Revenues	23.51%	39.82%

COMMUNITY FISCAL IMPACT

CHELSEA

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$897,159	$433,973	$1,331,132
FY 1985 Rate Revenues	$1,022,852	$0	$1,022,852
FY 1985 Total Revenues	$1,022,852	$0	$1,022,852
Total Revenues less Costs (Subsidy) Surplus	$125,693	($433,973) **	($308,280)

MWRA CHARGES			
FY 1986 MWRA Charge	$342,695	$426,346	$769,041
FY 1987 MWRA Charge (Current Method)	$476,917	$748,901	$1,225,818
MWRA Charge Increase ($)	$134,222	$322,555	$456,777
MWRA Charge Increase (%)	39.17%	75.66%	59.40%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	38.20%	53.16%
Community Water Rate Revenues	33.50%	46.63%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	98.24%	172.57%
Community Sewer Rate Revenues	N/A	N/A
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	57.77%	92.09%
Community Water/Sewer Rate Revenues	75.19%	119.84%

** No sewer user charges in effect in FY 1985

COMMUNITY FISCAL IMPACT

DEDHAM

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$60,406	$60,406
FY 1985 Rate Revenues	$0	$0	$0
FY 1985 Total Revenues	$0	$0	$0
Total Revenues less Costs (Subsidy) Surplus	$0	($60,406)	($60,406)
		**	

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$0	$367,610	$367,610
FY 1987 MWRA Charge (Current Method)	$0	$657,110	$657,110
MWRA Charge Increase ($)	$0	$289,500	$289,500
MWRA Charge Increase (%)	*	78.75%	78.75%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	608.57%	1087.82%
Community Sewer Rate Revenues	N/A	N/A
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	608.57%	1087.82%
Community Water/Sewer Rate Revenues	N/A	N/A

* Does not use MWRA water services

** No sewer user charges in effect in FY 1985

COMMUNITY FISCAL IMPACT

EVERETT

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,339,460	$528,012	$1,867,472
FY 1985 Rate Revenues	$1,449,157	$0	$1,449,157
FY 1985 Total Revenues	$1,449,657	$0	$1,449,657
Total Revenues less Costs (Subsidy) Surplus	$110,197	($528,012)	($417,815)
		**	

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$820,962	$659,238	$1,480,200
FY 1987 MWRA Charge (Current Method)	$1,063,257	$1,189,487	$2,252,744
MWRA Charge Increase ($)	$242,295	$530,249	$772,544
MWRA Charge Increase (%)	29.51%	80.43%	52.19%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	61.29%	79.38%
Community Water Rate Revenues	56.65%	73.37%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	124.85%	225.28%
Community Sewer Rate Revenues	N/A	N/A
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	79.26%	120.63%
Community Water/Sewer Rate Revenues	102.14%	155.45%

** No sewer user charges in effect in FY 1985

COMMUNITY FISCAL IMPACT

FRAMINGHAM

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$2,040,147	$1,581,085	$3,621,232
FY 1985 Rate Revenues	$1,412,565	$1,010,446	$2,423,011
FY 1985 Total Revenues	$1,581,969	$1,219,815	$2,801,784
Total Revenues less Costs (Subsidy) Surplus	($458,178)	($361,270)	($819,448)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$965,444	$965,444
FY 1987 MWRA Charge (Current Method)	$0	$1,735,358	$1,735,358
MWRA Charge Increase ($)	$0	$769,914	$769,914
MWRA Charge Increase (%)	ERR	79.75%	79.75%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	0.00%	0.00%
Community Water Rate Revenues	0.00%	0.00%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	61.06%	109.76%
Community Sewer Rate Revenues	95.55%	171.74%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	26.66%	47.92%
Community Water/Sewer Rate Revenues	39.84%	71.62%

COMMUNITY FISCAL IMPACT

HINGHAM

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$0	$0
FY 1985 Rate Revenues	$0	$0	$0
FY 1985 Total Revenues	$0	$0	$0
Total Revenues less Costs (Subsidy) Surplus	$0	$0	$0

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$0	$92,330	$92,330
FY 1987 MWRA Charge (Current Method)	$0	$166,474	$166,474
MWRA Charge Increase ($)	$0	$74,144	$74,144
MWRA Charge Increase (%)	*	80.30%	80.30%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs		
Community Sewer Rate Revenues		
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs		
Community Water/Sewer Rate Revenues		

* Does not use MWRA water services

Revenue & cost data as yet
not provided

COMMUNITY FISCAL IMPACT

HOLBROOK

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$100,000	$100,000
FY 1985 Rate Revenues	$0	$38,590	$38,590
FY 1985 Total Revenues	$0	$41,090	$41,090
Total Revenues less Costs (Subsidy) Surplus	$0	($58,910)	($58,910)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$56,493	$56,493
FY 1987 MWRA Charge (Current Method)	$0	$121,894	$121,894
MWRA Charge Increase ($)	$0	$65,401	$65,401
MWRA Charge Increase (%)	*	115.77%	115.77%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	56.49%	121.89%
Community Sewer Rate Revenues	146.39%	315.87%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	56.49%	121.89%
Community Water/Sewer Rate Revenues	146.39%	315.87%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

HOLBROOK

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$100,000	$100,000
FY 1985 Rate Revenues	$0	$38,590	$38,590
FY 1985 Total Revenues	$0	$41,090	$41,090
Total Revenues less Costs (Subsidy) Surplus	$0	($58,910)	($58,910)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$56,493	$56,493
FY 1987 MWRA Charge (Current Method)	$0	$121,894	$121,894
MWRA Charge Increase ($)	$0	$65,401	$65,401
MWRA Charge Increase (%)	*	115.77%	115.77%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	56.49%	121.89%
Community Sewer Rate Revenues	146.39%	315.87%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	56.49%	121.89%
Community Water/Sewer Rate Revenues	146.39%	315.87%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

LEXINGTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,208,604	$1,204,946	$2,413,550
FY 1985 Rate Revenues	$1,264,120	$615,000	$1,879,120
FY 1985 Total Revenues	$1,264,120	$615,000	$1,879,120
Total Revenues less Costs (Subsidy) Surplus	$55,516	($589,946)	($534,430)

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$633,206	$460,665	$1,093,871
FY 1987 MWRA Charge (Current Method)	$727,548	$809,468	$1,537,016
MWRA Charge Increase ($)	$94,342	$348,803	$443,145
MWRA Charge Increase (%)	14.90%	75.72%	40.51%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	52.39%	60.20%
Community Water Rate Revenues	50.09%	57.55%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	38.23%	67.18%
Community Sewer Rate Revenues	74.90%	131.62%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	45.32%	63.68%
Community Water/Sewer Rate Revenues	58.21%	81.79%

COMMUNITY FISCAL IMPACT

LYNN

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$0	$0
FY 1985 Rate Revenues	$0	$0	$0
FY 1985 Total Revenues	$0	$0	$0
Total Revenues less Costs (Subsidy) Surplus	$0	$0	$0

MWRA CHARGES			
FY 1986 MWRA Charge	$212,503	$0	$212,503
FY 1987 MWRA Charge (Current Method)	$267,618	$0	$267,618
MWRA Charge Increase ($)	$55,115	$0	$55,115
MWRA Charge Increase (%)	25.94%	*	25.94%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs		
Community Water Rate Revenues		
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	*	*
Community Sewer Rate Revenues	*	*
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs		
Community Water/Sewer Rate Revenues		

* Does not use MWRA sewer services

MWRA charges apply to General
Electric water use only

COMMUNITY FISCAL IMPACT

LYNNFIELD

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$815,000	$0	$815,000
FY 1985 Rate Revenues	$152,000	$0	$152,000
FY 1985 Total Revenues	$391,200	$0	$391,200
Total Revenues less Costs (Subsidy) Surplus	($423,800)	$0	($423,800)

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$37,928	$0	$37,928
FY 1987 MWRA Charge (Current Method)	$44,738	$0	$44,738
MWRA Charge Increase ($)	$6,810	$0	$6,810
MWRA Charge Increase (%)	17.96%	*	17.96%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	4.65%	5.49%
Community Water Rate Revenues	24.95%	29.43%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	*	*
Community Sewer Rate Revenues	*	*
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	4.65%	5.49%
Community Water/Sewer Rate Revenues	24.95%	29.43%

* Does not use MWRA sewer services

COMMUNITY FISCAL IMPACT

MALDEN

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$0	$0
FY 1985 Rate Revenues	$0	$0	$0
FY 1985 Total Revenues	$0	$0	$0
Total Revenues less Costs (Subsidy) Surplus	$0	$0	$0

MWRA CHARGES			
FY 1986 MWRA Charge	$538,790	$888,614	$1,427,404
FY 1987 MWRA Charge (Current Method)	$619,533	$1,575,883	$2,195,416
MWRA Charge Increase ($)	$80,743	$687,269	$768,012
MWRA Charge Increase (%)	14.99%	77.34%	53.80%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs		
Community Water Rate Revenues		
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs		
Community Sewer Rate Revenues		
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs		
Community Water/Sewer Rate Revenues		

Revenue & cost data as yet
not provided

COMMUNITY FISCAL IMPACT

MARBLEHEAD

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$846,839	$0	$846,839
FY 1985 Rate Revenues	$577,027	$0.	$577,027
FY 1985 Total Revenues	$620,304	$0	$620,304
Total Revenues less Costs (Subsidy) Surplus	($226,535)	$0	($226,535)

MWRA CHARGES			
FY 1986 MWRA Charge	$196,902	$0	$196,902
FY 1987 MWRA Charge (Current Method)	$240,421	$0	$240,421
MWRA Charge Increase ($)	$43,519	$0	$43,519
MWRA Charge Increase (%)	22.10%	*	22.10%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	23.25%	28.39%
Community Water Rate Revenues	34.12%	41.67%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	*	*
Community Sewer Rate Revenues	*	*
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	23.25%	28.39%
Community Water/Sewer Rate Revenues	34.12%	41.67%

* Does not use MWRA sewer services

COMMUNITY FISCAL IMPACT

MEDFORD

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,808,256	$84,027	$1,892,283
FY 1985 Rate Revenues	$1,479,703	$1,204,455	$2,684,158
FY 1985 Total Revenues	$1,813,810	$1,204,455	$3,018,265
Total Revenues less Costs (Subsidy) Surplus	$5,554	$1,120,428	$1,125,982

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$822,845	$968,487	$1,791,332
FY 1987 MWRA Charge (Current Method)	$909,574	$1,710,212	$2,619,786
MWRA Charge Increase ($)	$86,729	$741,725	$828,454
MWRA Charge Increase (%)	10.54%	76.59%	46.25%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	45.50%	50.30%
Community Water Rate Revenues	55.61%	61.47%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	1152.59%	2035.31%
Community Sewer Rate Revenues	80.41%	141.99%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	94.67%	138.45%
Community Water/Sewer Rate Revenues	66.74%	97.60%

COMMUNITY FISCAL IMPACT

MELROSE

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$776,691	$531,000	$1,307,691
FY 1985 Rate Revenues	$870,048	$39,373	$909,421
FY 1985 Total Revenues	$870,048	$39,373	$909,421
Total Revenues less Costs (Subsidy) Surplus	$93,357	($491,627)	($398,270)

MWRA CHARGES			
FY 1986 MWRA Charge	$342,695	$494,595	$837,290
FY 1987 MWRA Charge (Current Method)	$426,118	$869,801	$1,295,919
MWRA Charge Increase ($)	$83,423	$375,206	$458,629
MWRA Charge Increase (%)	24.34%	75.86%	54.78%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	44.12%	54.86%
Community Water Rate Revenues	39.39%	48.98%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	93.14%	163.80%
Community Sewer Rate Revenues	1256.18%	2209.13%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	64.03%	99.10%
Community Water/Sewer Rate Revenues	92.07%	142.50%

COMMUNITY FISCAL IMPACT

MILTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$742,663	$104,910	$847,573
FY 1985 Rate Revenues	$765,396	$614,196	$1,379,592
FY 1985 Total Revenues	$999,355	$696,805	$1,696,160
Total Revenues less Costs (Subsidy) Surplus	$256,692	$591,895	$848,587

MWRA CHARGES			
FY 1986 MWRA Charge	$284,055	$412,784	$696,839
FY 1987 MWRA Charge (Current Method)	$336,343	$733,501	$1,069,844
MWRA Charge Increase ($)	$52,288	$320,717	$373,005
MWRA Charge Increase (%)	18.41%	77.70%	53.53%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	38.25%	45.29%
Community Water Rate Revenues	37.11%	43.94%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	393.46%	699.17%
Community Sewer Rate Revenues	67.21%	119.42%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	82.22%	126.22%
Community Water/Sewer Rate Revenues	50.51%	77.55%

COMMUNITY FISCAL IMPACT

NAHANT

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$159,630	$0	$159,630
FY 1985 Rate Revenues	$93,000	$0	$93,000
FY 1985 Total Revenues	$107,000	$0	$107,000
Total Revenues less Costs (Subsidy) Surplus	($52,630)	$0	($52,630)

MWRA CHARGES			
FY 1986 MWRA Charge	$40,349	$0	$40,349
FY 1987 MWRA Charge (Current Method)	$53,278	$0	$53,278
MWRA Charge Increase ($)	$12,929	$0	$12,929
MWRA Charge Increase (%)	32.04%	*	32.04%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	25.28%	33.38%
Community Water Rate Revenues	43.39%	57.29%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	*	*
Community Sewer Rate Revenues	*	*
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	25.28%	33.38%
Community Water/Sewer Rate Revenues	43.39%	57.29%

* Does not use MWRA sewer services

COMMUNITY FISCAL IMPACT

NATICK

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$690,493	$690,493
FY 1985 Rate Revenues	$0	$458,476	$458,476
FY 1985 Total Revenues	$0	$458,476	$458,476
Total Revenues less Costs (Subsidy) Surplus	$0	($232,017)	($232,017)

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$0	$401,580	$401,580
FY 1987 MWRA Charge (Current Method)	$0	$754,010	$754,010
MWRA Charge Increase ($)	$0	$352,430	$352,430
MWRA Charge Increase (%)	*	87.76%	87.76%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	58.16%	109.20%
Community Sewer Rate Revenues	87.59%	164.46%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	58.16%	109.20%
Community Water/Sewer Rate Revenues	87.59%	164.46%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

NEEDHAM

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,263,504	$221,734	$1,485,238
FY 1985 Rate Revenues	$1,105,938	$0	$1,105,938
FY 1985 Total Revenues	$1,326,068	$124,696	$1,450,764
Total Revenues less Costs (Subsidy) Surplus	$62,564	($97,038)	($34,474)
		**	

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$105,176	$427,637	$532,813
FY 1987 MWRA Charge (Current Method)	$63,871	$760,080	$823,951
MWRA Charge Increase ($)	($41,305)	$332,443	$291,138
MWRA Charge Increase (%)	-39.27%	77.74%	54.64%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	8.32%	5.06%
Community Water Rate Revenues	9.51%	5.78%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	192.86%	342.79%
Community Sewer Rate Revenues	N/A	N/A
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	35.87%	55.48%
Community Water/Sewer Rate Revenues	48.18%	74.50%

** No sewer user charges in FY 1985

COMMUNITY FISCAL IMPACT

NEWTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$2,799,360	$2,031,851	$4,831,211
FY 1985 Rate Revenues	$2,836,236	$1,985,716	$4,821,952
FY 1985 Total Revenues	$3,215,395	$2,166,970	$5,382,365
Total Revenues less Costs (Subsidy) Surplus	$416,035	$135,119	$551,154

MWRA CHARGES			
FY 1986 MWRA Charge	$1,032,659	$1,411,457	$2,444,116
FY 1987 MWRA Charge (Current Method)	$1,198,296	$2,466,126	$3,664,422
MWRA Charge Increase ($)	$165,637	$1,054,669	$1,220,306
MWRA Charge Increase (%)	16.04%	74.72%	49.93%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	36.89%	42.81%
Community Water Rate Revenues	36.41%	42.25%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	69.47%	121.37%
Community Sewer Rate Revenues	71.08%	124.19%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	50.59%	75.85%
Community Water/Sewer Rate Revenues	50.69%	75.99%

COMMUNITY FISCAL IMPACT

NORWOOD

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$853,230	$597,146	$1,450,376
FY 1985 Rate Revenues	$990,213	$440,366	$1,430,579
FY 1985 Total Revenues	$1,012,783	$520,128	$1,532,911
Total Revenues less Costs (Subsidy) Surplus	$159,553	($77,018)	$82,535

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$503,552	$570,797	$1,074,349
FY 1987 MWRA Charge (Current Method)	$532,750	$983,073	$1,515,823
MWRA Charge Increase ($)	$29,198	$412,276	$441,474
MWRA Charge Increase (%)	5.80%	72.23%	41.09%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	59.02%	62.44%
Community Water Rate Revenues	50.85%	53.80%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	95.59%	164.63%
Community Sewer Rate Revenues	129.62%	223.24%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	74.07%	104.51%
Community Water/Sewer Rate Revenues	75.10%	105.96%

COMMUNITY FISCAL IMPACT

PEABODY

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,650,000	$0	$1,650,000
FY 1985 Rate Revenues	$1,980,049	$0	$1,980,049
FY 1985 Total Revenues	$2,106,435	$0	$2,106,435
Total Revenues less Costs (Subsidy) Surplus	$456,435	$0	$456,435

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$80,429	$0	$80,429
FY 1987 MWRA Charge (Current Method)	$113,915	$0	$113,915
MWRA Charge Increase ($)	$33,486	$0	$33,486
MWRA Charge Increase (%)	41.63%	*	41.63%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	4.87%	6.90%
Community Water Rate Revenues	4.06%	5.75%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	*	*
Community Sewer Rate Revenues	*	*
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	4.87%	6.90%
Community Water/Sewer Rate Revenues	4.06%	5.75%

* Does not use MWRA sewer services

COMMUNITY FISCAL IMPACT

QUINCY

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs			$5,469,000
FY 1985 Rate Revenues			$3,752,000
FY 1985 Total Revenues			$4,492,000
Total Revenues less Costs (Subsidy) Surplus			($977,000) ***

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$1,064,669	$1,421,341	$2,486,010
FY 1987 MWRA Charge (Current Method)	$1,306,052	$2,496,619	$3,802,671
MWRA Charge Increase ($)	$241,383	$1,075,278	$1,316,661
MWRA Charge Increase (%)	22.67%	75.65%	52.96%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs		
Community Water Rate Revenues		
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs		
Community Sewer Rate Revenues		
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	45.46%	69.53%
Community Water/Sewer Rate Revenues	66.26%	101.35%

*** Combined water & sewer revenue cost figures

COMMUNITY FISCAL IMPACT

RANDOLPH

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$1,477,232	$1,477,232
FY 1985 Rate Revenues	$0	$455,000	$455,000
FY 1985 Total Revenues	$0	$1,225,000	$1,225,000
Total Revenues less Costs (Subsidy) Surplus	$0	($252,232)	($252,232)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$374,032	$374,032
FY 1987 MWRA Charge (Current Method)	$0	$684,427	$684,427
MWRA Charge Increase ($)	$0	$310,395	$310,395
MWRA Charge Increase (%)	*	82.99%	82.99%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	25.32%	46.33%
Community Sewer Rate Revenues	82.20%	150.42%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	25.32%	46.33%
Community Water/Sewer Rate Revenues	82.20%	150.42%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

READING

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$900,172	$900,172
FY 1985 Rate Revenues	$0	$857,292	$857,292
FY 1985 Total Revenues	$0	$857,292	$857,292
Total Revenues less Costs (Subsidy) Surplus	$0	($42,880)	($42,880)

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$0	$315,664	$315,664
FY 1987 MWRA Charge (Current Method)	$0	$567,147	$567,147
MWRA Charge Increase ($)	$0	$251,483	$251,483
MWRA Charge Increase (%)	*	79.67%	79.67%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	35.07%	63.00%
Community Sewer Rate Revenues	36.82%	66.16%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	35.07%	63.00%
Community Water/Sewer Rate Revenues	36.82%	66.16%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

REVERE

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,335,262	$1,568,913	$2,904,175
FY 1985 Rate Revenues	$1,100,000	$0	$1,100,000
FY 1985 Total Revenues	$1,100,000	$0	$1,100,000
Total Revenues less Costs (Subsidy) Surplus	($235,262)	($1,568,913)	($1,804,175)
		**	

MWRA CHARGES			
FY 1986 MWRA Charge	$430,118	$671,218	$1,101,336
FY 1987 MWRA Charge (Current Method)	$544,748	$1,187,996	$1,732,744
MWRA Charge Increase ($)	$114,630	$516,778	$631,408
MWRA Charge Increase (%)	26.65%	76.99%	57.33%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	32.21%	40.80%
Community Water Rate Revenues	39.10%	49.52%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	42.78%	75.72%
Community Sewer Rate Revenues	N/A	N/A
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	37.92%	59.66%
Community Water/Sewer Rate Revenues	100.12%	157.52%

** No sewer user charges in FY 1985

COMMUNITY FISCAL IMPACT

SAUGUS

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$0	$0
FY 1985 Rate Revenues	$0	$0	$0
FY 1985 Total Revenues	$0	$0	$0
Total Revenues less Costs (Subsidy) Surplus	$0	$0	$0

MWRA CHARGES			
FY 1986 MWRA Charge	$384,120	$0	$384,120
FY 1987 MWRA Charge (Current Method)	$469,575	$0	$469,575
MWRA Charge Increase ($)	$85,455	$0	$85,455
MWRA Charge Increase (%)	22.25%	*	22.25%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs		
Community Water Rate Revenues		
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	*	*
Community Sewer Rate Revenues	*	*
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs		
Community Water/Sewer Rate Revenues		

* Does not use MWRA sewer services

Water revenue & cost data
as yet not provided

COMMUNITY FISCAL IMPACT

SOMERVILLE

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$2,139,090	$1,330,617	$3,469,707
FY 1985 Rate Revenues	$3,020,473	$2,013,649	$5,034,122
FY 1985 Total Revenues	$3,020,473	$2,013,649	$5,034,122
Total Revenues less Costs (Subsidy) Surplus	$881,383	$683,032	$1,564,415
MWRA CHARGES			
FY 1986 MWRA Charge	$953,575	$1,300,932	$2,254,507
FY 1987 MWRA Charge (Current Method)	$1,230,365	$2,263,649	$3,494,014
MWRA Charge Increase ($)	$276,790	$962,717	$1,239,507
MWRA Charge Increase (%)	29.03%	74.00%	54.98%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	44.58%	57.52%
Community Water Rate Revenues	31.57%	40.73%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	97.77%	170.12%
Community Sewer Rate Revenues	64.61%	112.42%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	64.98%	100.70%
Community Water/Sewer Rate Revenues	44.78%	69.41%

COMMUNITY FISCAL IMPACT

STONEHAM

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$563,728	$997,907	$1,561,635
FY 1985 Rate Revenues	$722,598	$602,273	$1,324,871
FY 1985 Total Revenues	$796,598	$1,283,403	$2,080,001
Total Revenues less Costs (Subsidy) Surplus	$232,870	$285,496	$518,366

MWRA CHARGES			
FY 1986 MWRA Charge	$313,913	$350,543	$664,456
FY 1987 MWRA Charge (Current Method)	$421,154	$618,459	$1,039,613
MWRA Charge Increase ($)	$107,241	$267,916	$375,157
MWRA Charge Increase (%)	34.16%	76.43%	56.46%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	55.69%	74.71%
Community Water Rate Revenues	43.44%	58.28%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	35.13%	61.98%
Community Sewer Rate Revenues	58.20%	102.69%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	42.55%	66.57%
Community Water/Sewer Rate Revenues	50.15%	78.47%

COMMUNITY FISCAL IMPACT

STOUGHTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$1,305,695	$1,305,695
FY 1985 Rate Revenues	$0	$541,736	$541,736
FY 1985 Total Revenues	$0	$541,736	$541,736
Total Revenues less Costs (Subsidy) Surplus	$0	($763,959)	($763,959)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$254,119	$254,119
FY 1987 MWRA Charge (Current Method)	$0	$484,706	$484,706
MWRA Charge Increase ($)	$0	$230,587	$230,587
MWRA Charge Increase (%)	*	90.74%	90.74%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	19.46%	37.12%
Community Sewer Rate Revenues	46.91%	89.47%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	19.46%	37.12%
Community Water/Sewer Rate Revenues	46.91%	89.47%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

SWAMPSCOTT

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$408,110	$0	$408,110
FY 1985 Rate Revenues	$433,575	$0	$433,575
FY 1985 Total Revenues	$454,575	$0	$454,575
Total Revenues less Costs (Subsidy) Surplus	$46,465	$0	$46,465

MWRA CHARGES			
FY 1986 MWRA Charge	$192,329	$0	$192,329
FY 1987 MWRA Charge (Current Method)	$232,487	$0	$232,487
MWRA Charge Increase ($)	$40,158	$0	$40,158
MWRA Charge Increase (%)	20.88%	*	20.88%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	47.13%	56.97%
Community Water Rate Revenues	44.36%	53.62%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	*	*
Community Sewer Rate Revenues	*	*
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	47.13%	56.97%
Community Water/Sewer Rate Revenues	44.36%	53.62%

* Does not use MWRA sewer services

COMMUNITY FISCAL IMPACT

WAKEFIELD

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$938,965	$377,093	$1,316,058
FY 1985 Rate Revenues	$1,161,878	$0	$1,161,878
FY 1985 Total Revenues	$1,175,002	$0	$1,175,002
Total Revenues less Costs (Subsidy) Surplus	$236,037	($377,093)	($141,056)
		**	
MWRA CHARGES			
FY 1986 MWRA Charge	$251,238	$406,623	$657,861
FY 1987 MWRA Charge (Current Method)	$280,411	$718,870	$999,281
MWRA Charge Increase ($)	$29,173	$312,247	$341,420
MWRA Charge Increase (%)	11.61%	76.79%	51.90%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	26.76%	29.86%
Community Water Rate Revenues	21.62%	24.13%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	107.83%	190.63%
Community Sewer Rate Revenues	N/A	N/A
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	49.99%	75.93%
Community Water/Sewer Rate Revenues	56.62%	86.01%

** No sewer user charges in FY 1985

COMMUNITY FISCAL IMPACT

WALPOLE

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$3,868,310	$3,868,310
FY 1985 Rate Revenues	$0	$188,413	$188,413
FY 1985 Total Revenues	$0	$2,716,669	$2,716,669
Total Revenues less Costs (Subsidy) Surplus	$0	($1,151,641)	($1,151,641)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$233,781	$233,781
FY 1987 MWRA Charge (Current Method)	$0	$419,946	$419,946
MWRA Charge Increase ($)	$0	$186,165	$186,165
MWRA Charge Increase (%)	*	79.63%	79.63%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	6.04%	10.86%
Community Sewer Rate Revenues	124.08%	222.89%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	6.04%	10.86%
Community Water/Sewer Rate Revenues	124.08%	222.89%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

WALTHAM

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$2,958,918	$1,826,418	$4,785,336
FY 1985 Rate Revenues	$2,941,183	$1,939,991	$4,881,174
FY 1985 Total Revenues	$3,116,362	$2,071,128	$5,187,490
Total Revenues less Costs (Subsidy) Surplus	$157,444	$244,710	$402,154

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$963,797	$1,088,696	$2,052,493
FY 1987 MWRA Charge (Current Method)	$1,058,620	$1,933,453	$2,992,073
MWRA Charge Increase ($)	$94,823	$844,757	$939,580
MWRA Charge Increase (%)	9.84%	77.59%	45.78%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	32.57%	35.78%
Community Water Rate Revenues	32.77%	35.99%
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	59.61%	105.86%
Community Sewer Rate Revenues	56.12%	99.66%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	42.89%	62.53%
Community Water/Sewer Rate Revenues	42.05%	61.30%

COMMUNITY FISCAL IMPACT

WATERTOWN

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$882,455	$930,307	$1,812,762
FY 1985 Rate Revenues	$0	$0	$0
FY 1985 Total Revenues	$0	$0	$0
Total Revenues less Costs (Subsidy) Surplus	($882,455)	($930,307)	($1,812,762)

MWRA CHARGES			
FY 1986 MWRA Charge	$353,724	$579,522	$933,246
FY 1987 MWRA Charge (Current Method)	$406,778	$1,019,319	$1,426,097
MWRA Charge Increase ($)	$53,054	$439,797	$492,851
MWRA Charge Increase (%)	15.00%	75.89%	52.81%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	40.08%	46.10%
Community Water Rate Revenues		
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	62.29%	109.57%
Community Sewer Rate Revenues		
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	51.48%	78.67%
Community Water/Sewer Rate Revenues		

Water & Sewer revenue data unavailable

COMMUNITY FISCAL IMPACT

WELLESLEY

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$2,883,792	$1,505,792	$4,389,584
FY 1985 Rate Revenues	$1,537,470	$936,723	$2,474,193
FY 1985 Total Revenues	$1,634,000	$1,604,958	$3,238,958
Total Revenues less Costs (Subsidy) Surplus	($1,249,792)	$99,166	($1,150,626)

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$0	$402,904	$402,904
FY 1987 MWRA Charge (Current Method)	$0	$715,909	$715,909
MWRA Charge Increase ($)	$0	$313,005	$313,005
MWRA Charge Increase (%)	ERR	77.69%	77.69%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	0.00%	0.00%
Community Water Rate Revenues	0.00%	0.00%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	26.76%	47.54%
Community Sewer Rate Revenues	43.01%	76.43%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	9.18%	16.31%
Community Water/Sewer Rate Revenues	16.28%	28.94%

COMMUNITY FISCAL IMPACT

WESTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$343,970	$0	$343,970
FY 1985 Rate Revenues	$310,362	$0	$310,362
FY 1985 Total Revenues	$387,412	$0	$387,412
Total Revenues less Costs (Subsidy) Surplus	$43,442	$0	$43,442

MWRA CHARGES			
FY 1986 MWRA Charge	$118,356	$0	$118,356
FY 1987 MWRA Charge (Current Method)	$145,218	$0	$145,218
MWRA Charge Increase ($)	$26,862	$0	$26,862
MWRA Charge Increase (%)	22.70%	*	22.70%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 198		
Community Water Costs	34.41%	42.22%
Community Water Rate Revenues	38.13%	46.79%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	*	*
Community Sewer Rate Revenues	*	*
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	34.41%	42.22%
Community Water/Sewer Rate Revenues	38.13%	46.79%

* Does not use MWRA sewer services

COMMUNITY FISCAL IMPACT

WESTWOOD

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$7,293,074	$7,293,074
FY 1985 Rate Revenues	$0	$197,364	$197,364
FY 1985 Total Revenues	$0	$2,496,849	$2,496,849
Total Revenues less Costs (Subsidy) Surplus	$0	($4,796,225)	($4,796,225)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$128,867	$128,867
FY 1987 MWRA Charge (Current Method)	$0	$234,631	$234,631
MWRA Charge Increase ($)	$0	$105,764	$105,764
MWRA Charge Increase (%)	*	82.07%	82.07%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	1.77%	3.22%
Community Sewer Rate Revenues	65.29%	118.88%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	1.77%	3.22%
Community Water/Sewer Rate Revenues	65.29%	118.88%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

WEYMOUTH

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$2,171,098	$2,171,098
FY 1985 Rate Revenues	$0	$893,251	$893,251
FY 1985 Total Revenues	$0	$1,003,251	$1,003,251
Total Revenues less Costs (Subsidy) Surplus	$0	($1,167,847)	($1,167,847)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$702,050	$702,050
FY 1987 MWRA Charge (Current Method)	$0	$1,276,685	$1,276,685
MWRA Charge Increase ($)	$0	$574,635	$574,635
MWRA Charge Increase (%)	*	81.85%	81.85%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	32.34%	58.80%
Community Sewer Rate Revenues	78.59%	142.93%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	32.34%	58.80%
Community Water/Sewer Rate Revenues	78.59%	142.93%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

WILMINGTON

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$0	$770,900	$770,900
FY 1985 Rate Revenues	$0	$384,323	$384,323
FY 1985 Total Revenues	$0	$384,323	$384,323
Total Revenues less Costs (Subsidy) Surplus	$0	($386,577)	($386,577)

MWRA CHARGES			
FY 1986 MWRA Charge	$0	$178,918	$178,918
FY 1987 MWRA Charge (Current Method)	$0	$255,872	$255,872
MWRA Charge Increase ($)	$0	$76,954	$76,954
MWRA Charge Increase (%)	*	43.01%	43.01%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985 Community Water Costs	*	*
Community Water Rate Revenues	*	*
MWRA Sewer Charge as % of FY 1985 Community Sewer Costs	23.21%	33.19%
Community Sewer Rate Revenues	46.55%	66.58%
MWRA Combined Charge as % of FY 1985 Community Water/Sewer Costs	23.21%	33.19%
Community Water/Sewer Rate Revenues	46.55%	66.58%

* Does not use MWRA water services

COMMUNITY FISCAL IMPACT

WINCHESTER

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,003,670	$588,800	$1,592,470
FY 1985 Rate Revenues	$792,800	$462,378	$1,255,178
FY 1985 Total Revenues	$851,596	$462,841	$1,314,437
Total Revenues less Costs (Subsidy) Surplus	($152,074)	($125,959)	($278,033)

MWRA CHARGES			
FY 1986 MWRA Charge	$143,104	$315,617	$458,721
FY 1987 MWRA Charge (Current Method)	$284,871	$559,528	$844,399
MWRA Charge Increase ($)	$141,767	$243,911	$385,678
MWRA Charge Increase (%)	99.07%	77.28%	84.08%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	14.26%	28.38%
Community Water Rate Revenues	18.05%	35.93%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	53.60%	95.03%
Community Sewer Rate Revenues	68.26%	121.01%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	28.81%	53.02%
Community Water/Sewer Rate Revenues	36.55%	67.27%

COMMUNITY FISCAL IMPACT

WINTHROP

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$623,066	$882,507	$1,505,573
FY 1985 Rate Revenues	$676,679	$326,453	$1,003,132
FY 1985 Total Revenues	$908,420	$326,452	$1,234,872
Total Revenues less Costs (Subsidy) Surplus	$285,354	($556,055)	($270,701)

MWRA CHARGES			
FY 1986 MWRA Charge	$195,826	$320,483	$516,309
FY 1987 MWRA Charge (Current Method)	$238,829	$561,091	$799,920
MWRA Charge Increase ($)	$43,003	$240,608	$283,611
MWRA Charge Increase (%)	21.96%	75.08%	54.93%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water charge as % of FY 1985		
Community Water Costs	31.43%	38.33%
Community Water Rate Revenues	28.94%	35.29%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	36.32%	63.58%
Community Sewer Rate Revenues	98.17%	171.87%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	34.29%	53.13%
Community Water/Sewer Rate Revenues	51.47%	79.74%

COMMUNITY FISCAL IMPACT

WOBURN

WATER & SEWER	WATER	SEWER	COMBINED
FY 1985 Costs	$1,032,023	$1,044,231	$2,076,255
FY 1985 Rate Revenues	$905,715	$868,326	$1,774,042
FY 1985 Total Revenues	$905,715	$868,326	$1,774,042
Total Revenues less Costs (Subsidy) Surplus	($126,308)	($175,905)	($302,213)

MWRA CHARGES	WATER	SEWER	COMBINED
FY 1986 MWRA Charge	$239,134	$684,415	$923,549
FY 1987 MWRA Charge (Current Method)	$387,613	$1,195,811	$1,583,424
MWRA Charge Increase ($)	$148,479	$511,396	$659,875
MWRA Charge Increase (%)	62.09%	74.72%	71.45%

MWRA CHARGE ANALYSIS	FY 1986	FY 1987
MWRA Water Charge as % of FY 1985		
Community Water Costs	23.17%	37.56%
Community Water Rate Revenues	26.40%	42.80%
MWRA Sewer Charge as % of FY 1985		
Community Sewer Costs	65.54%	114.52%
Community Sewer Rate Revenues	78.82%	137.71%
MWRA Combined Charge as % of FY 1985		
Community Water/Sewer Costs	44.48%	76.26%
Community Water/Sewer Rate Revenues	52.06%	89.26%

COMMUNITY QUESTIONNAIRE

Attachment C

A) **SERVICE DATA - SEWER COMMUNITY** (Only respond if your community receives MWRA sewer services.)

1. If your community uses sewer services as a way to manage new development (for instance, do you require developers to pay for I/I reductions elsewhere in order to hook-up to the sewer system), please describe:

____

____

____

2. What dollar amount will your community collect in sewer user charges in FY86? __________ FY87? __________

3. If this amount has increased recently, what was the cause? (Rank in order of importance.)

_____ Passing on increases in local costs

_____ Passing on increases from MWRA

_____ Moving to recovery of a greater % of these costs

_____ Other (describe) ______________________________

4. Do you keep a file (letter, meetings, calls) of customers reaction to rate increases? __________

5. Do you have any reactions from FY87 increases? __________

6. What is your rate schedule(s) for sewer user charges by customer classification (Residential, Commercial, Industrial, other) for the fiscal years 1985, 1986 and 1987? Please attach.

7. What is your definition for each class?

Residential ______________________________ ______________

____

Commercial ______________________________________

____

Industrial ______________________________________

____

Other ____

____

8. Did you collect a surcharge for suspended solids, BOD or other? If yes, please list the total amounts.

Description	FY 1983	FY 1984	FY 1985
Suspended Solids			
BOD			
Other			

9. What is the frequency (i.e., monthly, quarterly, etc.) of your sewer user charge billing?

Residential ____________________
Commercial ____________________
Industrial ____________________
Other ____________________

10. Are your community's water bills (if applicable) billed jointly with your sewer bills? __________ Are they separately identified on the bill? ______________

11. Are your FY 1987 sewer revenues and expenditures accounted for in:

- the general fund? __________
- a special revenue fund? __________
- an enterprise fund? __________
- other? (Explain) ____

12. Do you report sewer operations on an accrual __________ or modified accrual __________ basis? (Check one)

13. Do you plan to adopt Chapter 40, Section 39K which establishes an enterprise fund? __________ If yes, do you plan to account on an accrual __________ or modified accrual __________ basis? (Check one)

14. Have you adopted Chapter 44, Section 53E (Chapter 339) to allow for offset receipts for your sewer fund? __________

15. Have you adopted any special financial/accounting legislation for sewers? Please describe the intent of the legislation and note the act.

____
____
____

16. Have you adopted Chapter 40, Section 39j (Chapter 275) which encourages municipalities to adopt a pricing system to recover full sewer costs? ___________

17. Please complete Attachment A regarding sewer expenditures and revenues. List direct costs only for FY 1983, 1984 and 1985 results. These figures should be consistent with Schedule A numbers. If you do not have a breakdown of sewer user charges by class, enter one number for all sewer user charges and mark it "TOTAL SEWER USER CHARGES."

SEWER

Direct Revenues and Expenditures
FY 1983, 1984 and 1985

	FY 1983	FY 1984	FY 1985
Revenues			
Sewer User Charges, Residential			
Sewer User Charges, Commercial			
Sewer User Charges, Industrial			
Grants			
Other Revenue including septic fees connection fees, interest revenue, etc.			
Total Revenues			
Expenditures			
Personnel Services			
Ordinary Maintenance including purchase of services, supplies and expenses and out-of-state travel			
Debt Service including interest and principal payments			
MWRA Assessment			
Capital Outlay			
Total Expenditures			
Excess (Deficiency) of Revenues over Expenditures			

Of the sewer expenditures for FY 1983, 1984 and 1985, how much was spent on specific major programs directed to eliminate inflow and infiltration (I/I) and separation of sewers?

Description	FY 1983	FY 1984	FY 1985
Inflow/Infiltration			
Separation of Sewers			

B) SERVICE DATA - WATER COMMUNITY (Only respond if your community receives MWRA water services.)

1. If you don't receive 100% of your community delivered water from the MWRA, what percent do you receive? __________.

2. If your community uses water services as a way to manage new development, please describe:

____

____

____

3. What dollar amount will your community collect in water user charges during FY86? __________ FY87? __________

4. If this amount increased recently, what was the cause? (Rank in order of importance.)

_____ Passing on increases in local costs

_____ Passing on increases from MWRA

_____ Moving to recovery of a greater % of true costs

_____ Other

5. Do you keep a file (letter, meetings, calls) of customer reactions to rate increases? __________

6. Do you have any reactions from FY 1987 Authority assessments? __________

7. What is your rate schedule(s) for water user charges by customer classification (Residential, Commercial, Industrial, other) for the fiscal years, 1985, 1986 and 1987?

8. What is the frequency (i.e., monthly, quarterly, etc.) of your water user charge billing?

Residential ____

Commercial ____

Industrial ____

9. What is your definition for each class?

Residential ____

____

Commercial ____

____

Industrial ____

____

10. Are your FY 1987 water revenues and expenditures accounted for in:
- the general fund? __________
- a special revenue fund? __________
- an enterprise fund? __________
- other? (Explain) ____

11. Have you adopted Chapter 41, Section 69B which allows municipalities to establish a water surplus account? __________

12. Do you report on an accrual __________ or modified accrual __________ basis? (Check one)

13. Do you plan to adopt Chapter 40, Section 39K which establishes an enterprise fund? _________ If yes, do you plan to account on an accrual __________ or modified accrual __________ basis? (Check one)

14. Have you adopted Chapter 44, Section 53E (Chapter 339) to allow for offset receipts for your water fund? __________

15. Have you adopted Chapter 40, Section 39j (Chapter 275) which encourages municipalities to adopt a pricing system to recover full water costs? __________

16. Have you adopted special financing/accounting legislation for water? If so, please describe the intent of the legislation and note the act.

____

____

____

____

17. Please complete Attachment B regarding water expenditures and revenues. List **direct** costs only for FY 1983, 1984 and 1985 results. These figures should be consistent with Schedule A numbers. If you do not have a breakdown of water user charges by class, enter one number for all water user charges and mark it "TOTAL WATER USER CHARGES."

WATER

Direct Revenues and Expenditures
FY 1983, 1984 and 1985

	FY 1983	FY 1984	FY 1985
Revenues			
Water User Charges, Residential			
Water User Charges, Commercial			
Water User Charges, Industrial			
Grants			
Other Revenue including interest, connection fees, etc.			
Total Revenues			
Expenditures			
MWRA Assessment			
Capital Outlay			
Debt Service including interest and principal payments			
Ordinary Maintenance including purchase of services, supplies and expenses and out-of-state travel			
Personnel Services			
Total Expenditures			
Excess (Deficiency) of Revenues over Expenditures			

Of these water expenditures, how much was spent to eliminate leakage in the water system?

FY 1983 ______________

FY 1984 ______________

FY 1985 ______________

C) COMMUNITY DATA

1. Please list your community's total annual community delivered water for both metered and unmetered users in millions of gallons for the year ending December 31, 1985:

	Metered Accounts	Unmetered Estimate
Residential Use	________MG	________MG
Commercial Use	________MG	________MG
Industrial Use	________MG	________MG
Public Use	________MG	________MG
Other Uses	________MG	________MG
Hydrants	________MG	________MG
Blowoffs		________MG
Main Breaks		________MG

2. How many water service connections (not including fire protection, as listed under Question #3) existed as of December 31, 1985? ________

3. How many public hydrants? ________ How many private fire protection connections (sprinklers, standpipes, etc.)? ________

4. How many meters were in working order as of December 31, 1985? ________

5. How many meters were not in working order? ________

6. How many water service connections (not including private fire protection) were not metered as of December 31, 1985? ________

7. Please list the total number of miles of water main, 4 inches or larger as of December 31, 1985? ________

8. Please list the total number of miles of sewer main as of December 31, 1985? ________

9. What percent of your sewerage flow is from storm sewers? ________

D) COMMUNITY QUESTIONS

1. Who in your community is empowered to change rates?

_____ Selectmen or City Council

_____ Town Manager or Mayor

_____ Town Meeting

_____ Public Works Superintendent or Commissioner

_____ Other (Describe) ______________________________

____

2. What are the dates of this year's Town Meeting (if applicable)?

____

3. Would you be interested in receiving technical assistance from the Authority to help develop local rate structures? Please comment:

____

____

____

4. How is septage disposal handled in your community? Please describe:

____

____

____

5. What has your community done to detect leaks and to repair and/or replace old or broken pipelines? Please describe programs and results: ________

____

____

____

6. Please describe any existing (or planned) metering maintenance or expansion programs: ______________________________

____

____

7. Please describe industrial pretreatment programs, results and costs: ______________________________

____

____

____

____

8. What has your community done to promote water conservation (e.g., use restrictions, education programs, building moratoriums)? Please describe program and results: ______

9. Has your community received any outside grants or loans for system rehabilitation? Please describe funding and its impact: ______

10. Do you envision your community making any major changes in the way it charges customers (e.g., moving to enterprise funding or moving to ascending block rates)?

11. How do you feel MWRA could help you address any of these?

E) LOCAL CONTACTS

1. Community ____________________

2. Name of person completing this questionnaire: ____________________

3. Best person with whom to discuss local rate-setting:

Sewer	**Water**
Name____________________	Name____________________
Address__________________	Address__________________
__________________	__________________
Phone Number______________	Phone Number______________

4. Best person with whom to discuss status of local systems:

Sewer	**Water**
Name____________________	Name____________________
Address__________________	Address__________________
__________________	__________________
Phone Number______________	Phone Number______________

5. Best person with whom to discuss problems with MWRA operations:

Name____________________
Address__________________
____
Phone Number______________

6. Best person with whom to discuss educational programs for water conservation:

Name____________________
Address__________________
____
Phone Number______________